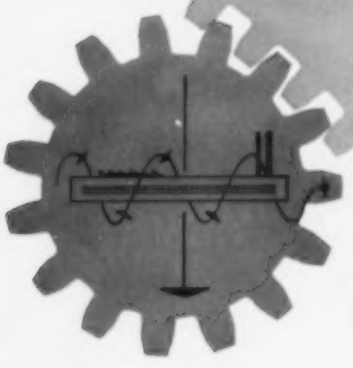
MAY 28, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Integrated Handling . . .

"It means control at the management, policy-making level" . . . page 106

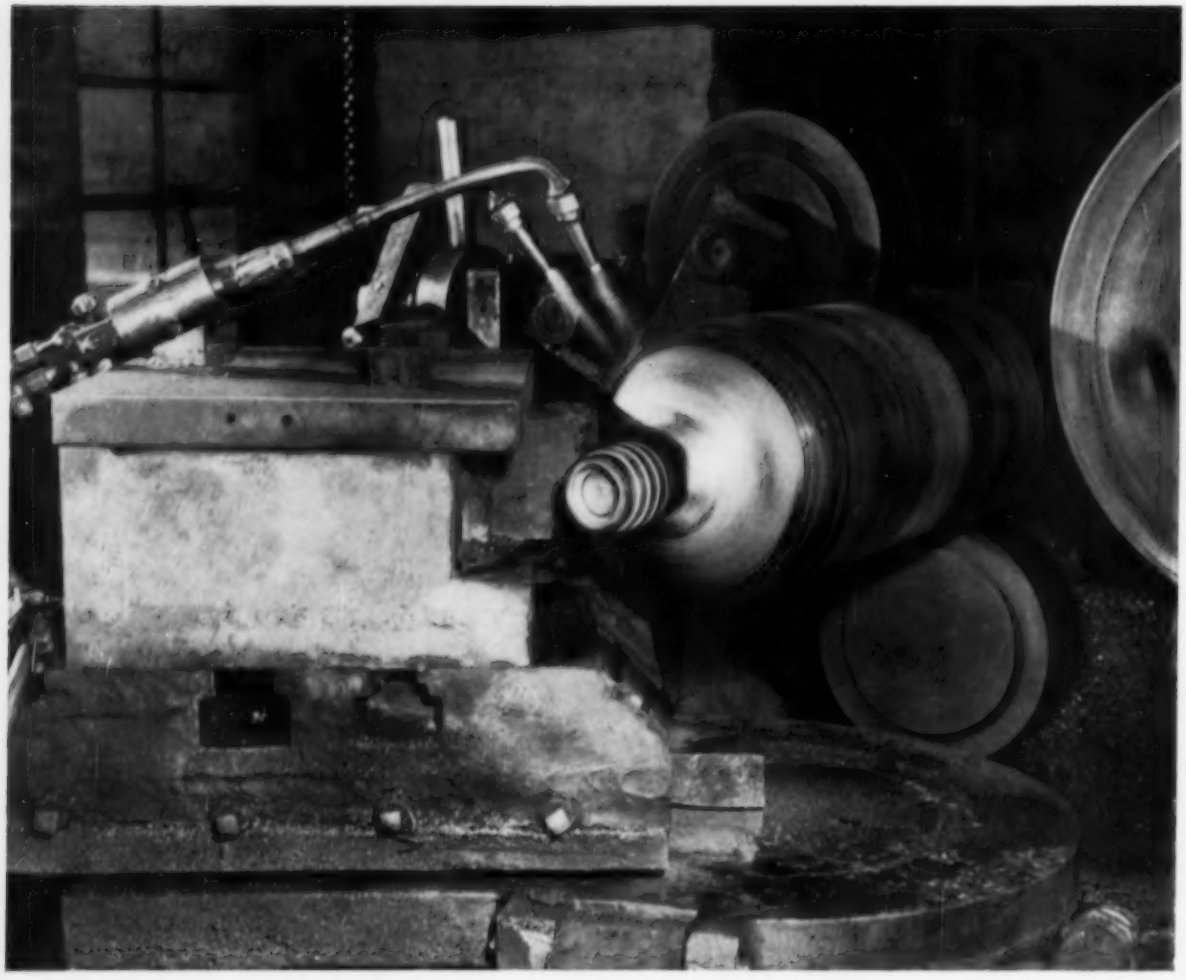
George G. Raymond Jr., President Material Handling Institute Inc..

▶ Bulk Handling in Steelmaking . . page 114

▶ Guide to the Handling Show . . . page 129

CONTENTS — PAGE 5

MATERIAL HANDLING ISSUE



How to bottle up 2400 psi

The Marison Company of South Elgin, Ill., is a leading producer of industrial oxygen cylinders manufactured to hold this active gas at 2400 psi. From its beginning, Marison has consistently used Seamless Tubing for this task.

Marison has found B&W Seamless Tubing to be ideal for its complicated cycle of spinning, forming, heat-treating and threading operations. Every ounce and every inch of tubing—and every operation by Marison—must be flawless in every respect to meet the demands of these pressure cylinders.

Whatever your requirements in tubing...for consistently high and uniform quality...for top service ...look to B&W. For more information on selection and use of carbon, alloy or stainless steel tubing, write for Bulletin 361 or call in Mr. Tubes, your nearby B&W Tube Representative. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

TA-5075P

Seamless and welded tubular products, seamless welding fittings and flanges—in carbon, alloy and stainless steels

Welding Steel Plates for Power Presses

Here, in the making, are the frames for two sturdy power presses, designed to give years of trouble-free service. The frame on the left is for an open-back inclinable press. At the right is the frame for a 100-ton straight-side, double-crank press. These are only two of the many types and sizes of presses, shears and other equipment being manufactured by Niagara Machine and Tool Works, of Buffalo, from welded Bethlehem steel plates.

The uniform quality of Bethlehem plates assures sound welds, provided of course that good welding techniques are followed. Bethlehem plates come in a full range of sheared and universal mill sizes.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation.

BETHLEHEM STEEL

BETHLEHEM STEEL

Can your interruptible contract shut your plant?

Don't let it happen! Install your own

PHILGAS® System

and be prepared for emergencies.

Don't let high gas demands play havoc with your production schedule. Install a standby Philgas system that will keep your factory running when your gas supply is shut off. Also, many industries are using Philgas for peak-shaving to avoid high demand charges.

Philgas, a high-quality Phillips Petroleum Company product, gives you exceptionally clean heat, uniform pressure and thermal content. There are many ways by which an automatic Philgas system can save you money. Let us tell you more about Philgas for heat treating . . . for space heating . . . and as a motor fuel for trucks and heavy duty equipment. Philgas is America's largest selling LP-Gas. Write for full information.

Philgas is our name for high-quality LP-Gas—Bottled Gas—Butane—Propane.

Phillips 66 Philgas
THE ALL-PURPOSE FUEL

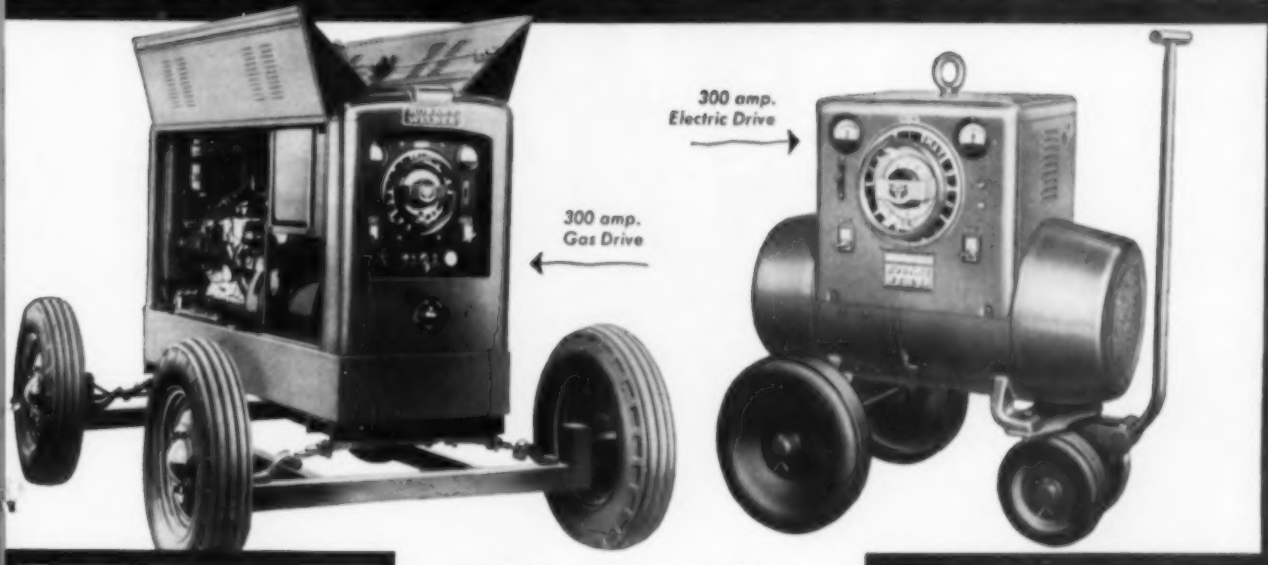
PHILLIPS PETROLEUM COMPANY

Sales Department • Bartlesville, Oklahoma

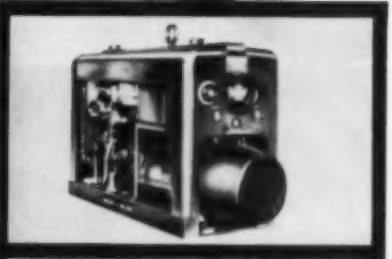
Offices located in

Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Houston, Tex., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., Salt Lake City, Utah, St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.

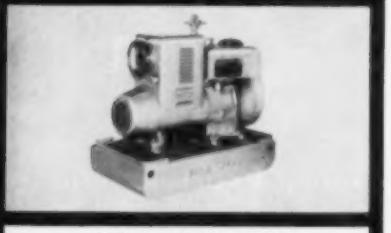
HOBART ARC WELDERS



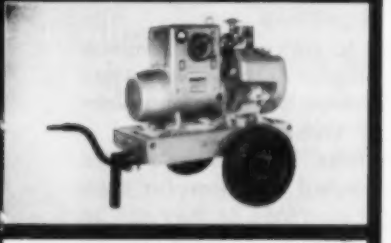
HOBART ARC WELDING ELECTRODES



250 amp. "Pipeliner"



200 amp. "Husky Boy"



200 amp. AC Power-AC Welder

Electrodes for all requirements

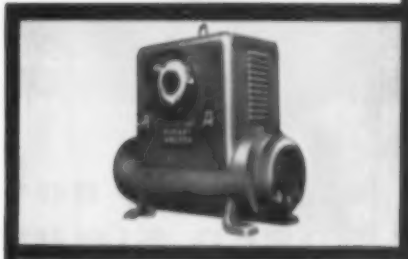
new low cost arc welders
for PRODUCTION MAINTENANCE CONSTRUCTION and REPAIR

Gas Engine Drive for emergency outside repair jobs and building construction. Electric Motor Drive for shop use on production, maintenance and repair work. With Hobart's new "extra" built-in features (at no extra cost), you can increase weld quality, save on actual production time that lets you increase your profits.

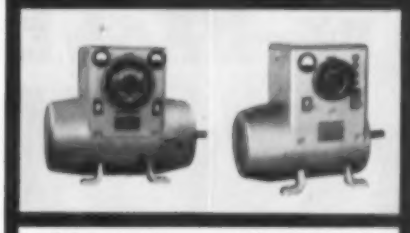
Produce superior welding at less expense by choosing one of these welders that is specifically designed to do your work. A simple comparison will prove to you that their rugged construction, cooler operation and extra capacity will give you constant top performance for many years—without expensive servicing.

Better Quality Electrodes

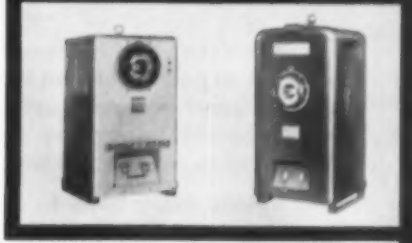
Hobart electrodes are made to the most exacting specifications in a complete range of types and sizes for A.C. and D.C. welding. They are unexcelled for quality and uniformity. Try them. See how you can increase welding speed and get sounder welds at lower cost.



250 amp. "Bantam Champ"



200 amp. D.C. 200 amp. AC-AC



180 to 500 amp. Transformers 300 amp. DC Rectifier

Hobart Brothers Company Box ST-56, Troy, Ohio

"One of the world's largest builders of arc welding equipment"

Mail the Coupon Today!

● HOBART BROTHERS COMPANY, BOX ST-56, TROY, OHIO, Phone 21223

Without obligation, please send me complete information on the items checked below:

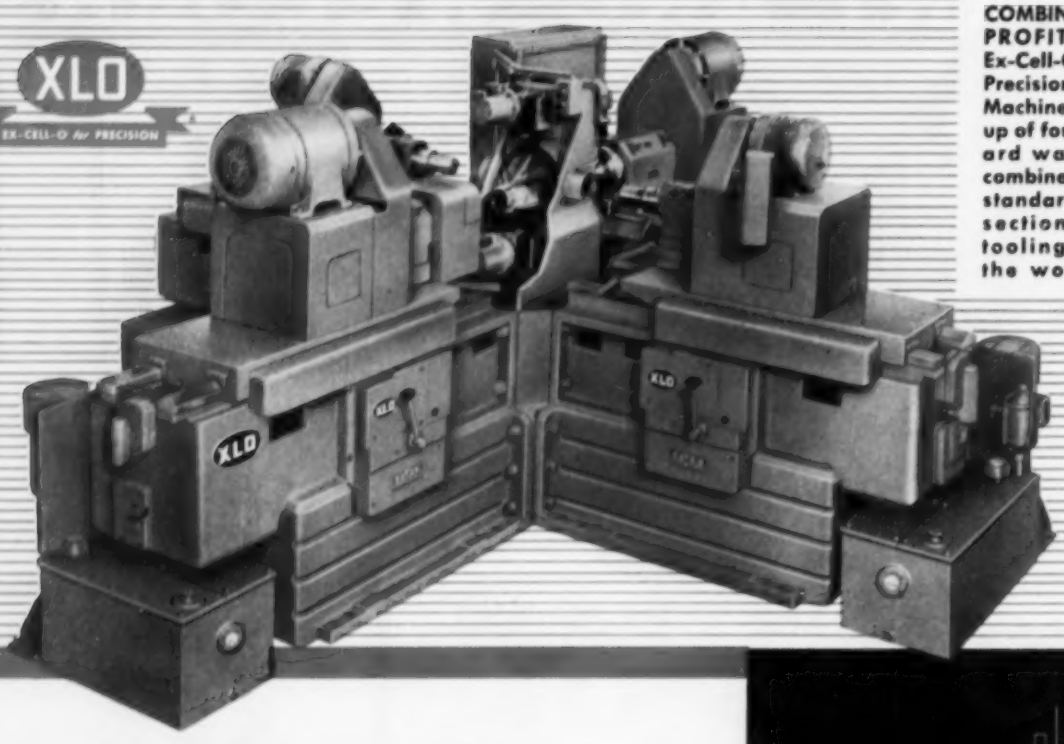
- ☐ "Pipeliner"
- ☐ "Husky Boy"
- ☐ AC Power—AC Welder
- ☐ "Bantam Champ"
- ☐ D.C. "Build Your Own"
- ☐ AC-AC "Build Your Own"
- ☐ Transformers
- ☐ Rectifier

Name_____

Firm_____

Address_____

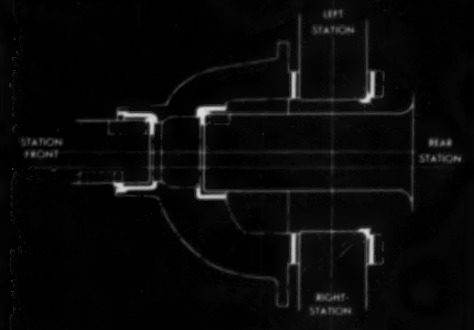
City_____ State_____



COMBINED FOR PROFITS—this Ex-Cell-O 4-Way Precision Boring Machine is made up of four standard way units combined with a standard center section, with tooling to suit the work.

4 HOLES, 90° APART, BORED SIMULTANEOUSLY

BY EX-CELL-O 4-WAY MACHINE



SIMULTANEOUS MACHINING of four holes assures a 90° relationship between bearing bores and pinion bores.

This differential carrier assembly requires the boring of accurate holes at right angles to one another. Bore diameters are held as close as .0005". Shoulders must be square with bores. Bearing bores must be square with pinion bores.

Here was an opportunity to combine operations by using an Ex-Cell-O 4-Way Precision Boring Machine, with these profitable results:

FASTER PRODUCTION—machine works simultaneously from four directions.

PRECISION—accurate bores, holding the 90° relationship, are produced by precision spindles, smooth, hydraulically operated slides, and accurate location of the way units.

RELOCATION ERRORS ELIMINATED—since the part is located and clamped only once, there can be no errors caused by relocating and reclamping.

Is there an opportunity to cut costs and combine operations in your product? These way-type precision boring machines, special machines composed of standard units, also are used in automated production lines. They can be placed side by side and connected with transfer type fixtures to form transfer machines, or they can be combined in a transfer machine at those stations where precision boring and similar operations are required.

Ask your Ex-Cell-O Representative about all the other advantages of Ex-Cell-O Way Machines, or write for Bulletin.

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

56-3

STEEL
The Metalworking Weekly

MAY 28, 1956
Vol. 138 No. 22

METALWORKING OUTLOOK, 59

The Editor's Views, 63

Steel Men Look Ahead, 65

Good Business for Mill Suppliers, 67

PA's Take Economic Pulse, 68

How To Double Sales Yearly, 69

Oil's Bill for Improvements: $850 Million, 70

TV Captivates Metalworking, 71

Management at Work, 75
Superior's Kowall: Caster of quality

Shop Rules Need Human Touch, 76

Get Set for Arbitration, 77

Cost: One Key to Adoption of Atom, 77

Windows of Washington, 72
Mirrors of Motordom, 79
The Business Trend, 83
Men of Industry, 87
New Products, 129

Behind the Scenes, 6
Letters to the Editors, 10
Calendar of Meetings, 27
Progress in Steelmaking, 114
Machine Topics, 123

MATERIAL HANDLING SECTION, 105

Integrated Handling, 106
Pressure grows for broadening handling's scope. Here's what emphasis on controlled movement means to you

Bulk Handling in Steelmaking, 114

Tape Directs the Conveyor, 126

At the Material Handling Show . . .
New Products, 129
Exhibitors and Program, 168

MARKET OUTLOOK, 173

Steel Operations, 173
Price Comparisons, 174
Nonferrous Roundup, 176

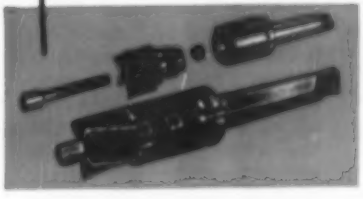
Nonferrous Prices, 178
Steel Prices, begin 180
Scrap Prices, 198

Editorial & Business Staffs, 16. Advertising Index, 202. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 W. 39th St., New York 18, N. Y.

Published every Monday by The Penton Publishing Co., Penton Bldg., Cleveland 13, O. Subscription in the United States and its possessions, Canada, Mexico, Cuba, Central and South America, $10 a year; all other countries, $20 a year. Single copies (current issues), 50 cents. Metalworking Yearbook issue, $2. Accepted as controlled circulation publication at Cleveland. Copyright, 1956, The Penton Publishing Co.

Continental
Counterbore Sets
Save Your Time—
Save Your Tools

A Twist of the Wrist engages or releases the cutters. Double lugs on cutter engage double abutments in holder. Double aligning bearings for rigidity.



Phantom view shows the strong, rigid drive for quick interchangeability of tools.

CONTINENTAL has three STANDARD COUNTERBORE SETS for your selection. They are toolroom favorites. WRITE FOR CATALOG and prices.

CTW

CONTINENTAL TOOL WORKS
Division of
Ex-Cell-O Corporation
Detroit 32, Michigan

machines last longer...

Priced from $190.00

wear reduced as much as 80% with easy-to-move

TORIT DUST COLLECTORS

Dust causes wear, damages bearings, bedways, slides and saddles and other "sensitive" machine parts. Clean machines hold close tolerances better and need re-grinding or alignment only ¼ as often. In five years, users of Torit dust collectors save up to $1,600 in re-grinding the ways of the average grinder—and save hundreds of dollars *more* in down-time.

MANY COMPACT MODELS . . . all self-contained. Unitized for custom installation. More economical, usually more efficient than central (built-into-the-building) systems. For more information, write today to . . .

TORIT MANUFACTURING COMPANY

Sweet's

Dept. 507
311 Walnut Street,
St. Paul 2, Minn.

behind the scenes

Responsibilities of Trust

Early in June STEEL's business staff will assemble for a sales meeting. To better acquaint our business people with STEEL's aims and policies, six editors plan to attend, to beat the drums and make big medicine.

Naturally, we can't reveal the program that is calculated to make STEEL salesmen 10 ft tall; what we can reveal, however, is a conversation we had with Copy Editor Harry Chandler over his proposed pitch, "Copy To Incite Action."

"When copy is wrote," said Harry, who frequently reverts to the vulgate in a subconscious revolt against the world of blue pencils, "it can incite action. You see, readers tend to believe the printed word. Because we print things, you might say that we are in a position of trust. So when we write something that will incite . . ."

"Did you say 'excite,' Harry?"

"INcite," the honest fellow repeated, shaking his large, square head. "And, incidentally, I have it on authority that your attempts to EXcite by dragging in references to sex are not meeting with approval. You will be wise to select subjects and comments of interest to metalworking management and supervisory personnel."

Defendant, who knoweth where his bread is buttered, hereby promises to stick to standard attention-getters, namely, the flag, puppy dogs and mothers.

Prices a la Swahili

Some persons like to torture themselves by throwing away a small pair in the hope of drawing to an inside straight; others like to compute the national debt. Our favorite form of self-confusion is to study price indexes of finished steel. A body would think that a body could order, say, a bundle of galvanized flat sheets and easily figure the price. Here's part of what we read in the price book: ". . . in applying the package weight extra, the ordered item weight determines the applicable packaging extra regardless of how the items are assembled in the shipping package. However, when the buyer specifies or requires a definite package weight which is less than the ordered item weight, then include the extra in the above table, for the specified package weight applies to the entire item. Conversely, when the buyer specifies or requires a package . . ."

At that point we considered the use of cedar shingles.

Frustrated Forger

Stanley Stewart, STEEL's eastern scout, reports that early in the merry month of May he accepted an invitation to visit the Chambersburg Engineering Co., particularly its new foundry. Stan learned that in 1936 this foundry adopted the cement bonded sand method of casting, and that this superior method has been used by the company ever since.

"They make castings from 10,000 to 100,000 lb," Stan declared. "They also let me run a forging operation; well, anyway, I pushed a button." In recognition of his ability, the company gave him a card reading: International Order of Frustrated Forgers. It also included rules of membership, which are: 1. Not overwork to meet production. 2. Not handle any stock. 3. Always wear a white shirt on the job. This whimsical business merely directed guests' attention to the Chambersburg Impacter forge.

Stewart complained that his visit was all too brief; moreover, he was unable to devote complete attention, because he remembered there are two girls' schools in Chambersburg.

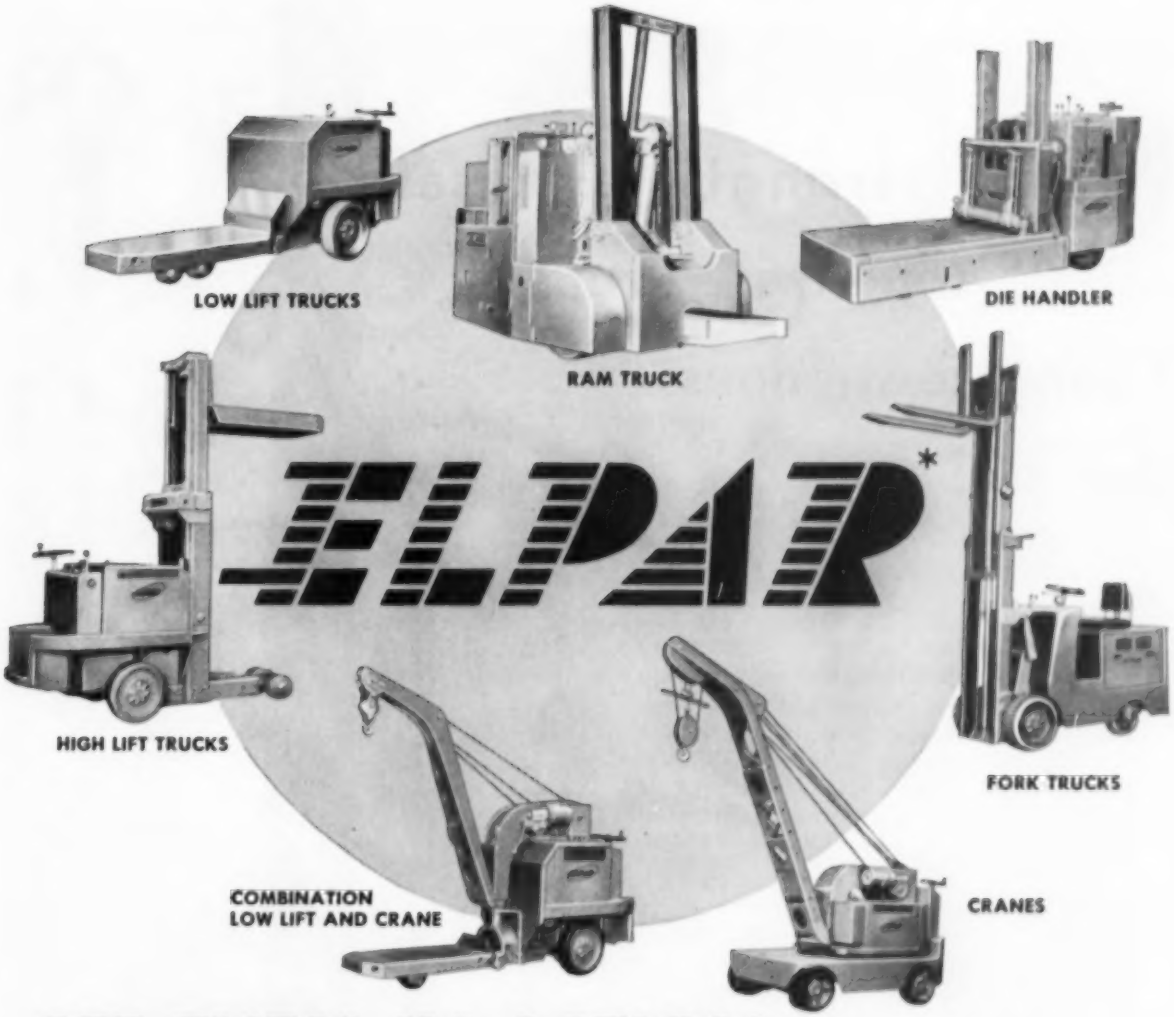
Copy To Incite

We were on the subject of writing copy to incite action. Here's a limerick on finished steel prices: Can we incite you to finish it?

Young Robert McTavish McTate
Thought he'd buy finished steel by the crate;
When he checked the devices
For figuring prices

Shrdlu

(Metalworking Outlook—Page 59)



SEE THEM IN ACTION—
At The MHI'S Exposition

Booth 1020

The MATERIAL HANDLING INSTITUTE'S EXPOSITION
Cleveland, Ohio
PUBLIC AUDITORIUM
JUNE 5th THRU 8th
1956
mhi
EXHIBITOR

It's a double celebration for Elwell-Parker—an outstanding exhibit of modern trucks plus a display of the world's first industrial truck, built by Elwell-Parker in 1906. You'll see the outstanding progress made in fifty years of industrial truck building.

NEW FORK TRUCKS

Low headroom type—lower battery compartment keeps operator's head below uprights even with short mast.

Operator stand-up, center control—equipped with hydraulic lift and tilt. Models from 4,000 to 10,000 lbs. capacity.

NEW PLATFORM TRUCKS

Hydraulic high lift models—a new concept in high lift platform truck design.

Inclined Press Die Handler—a unique truck built to handle dies in and out of inclined presses.

WATCH THE DEMONSTRATION

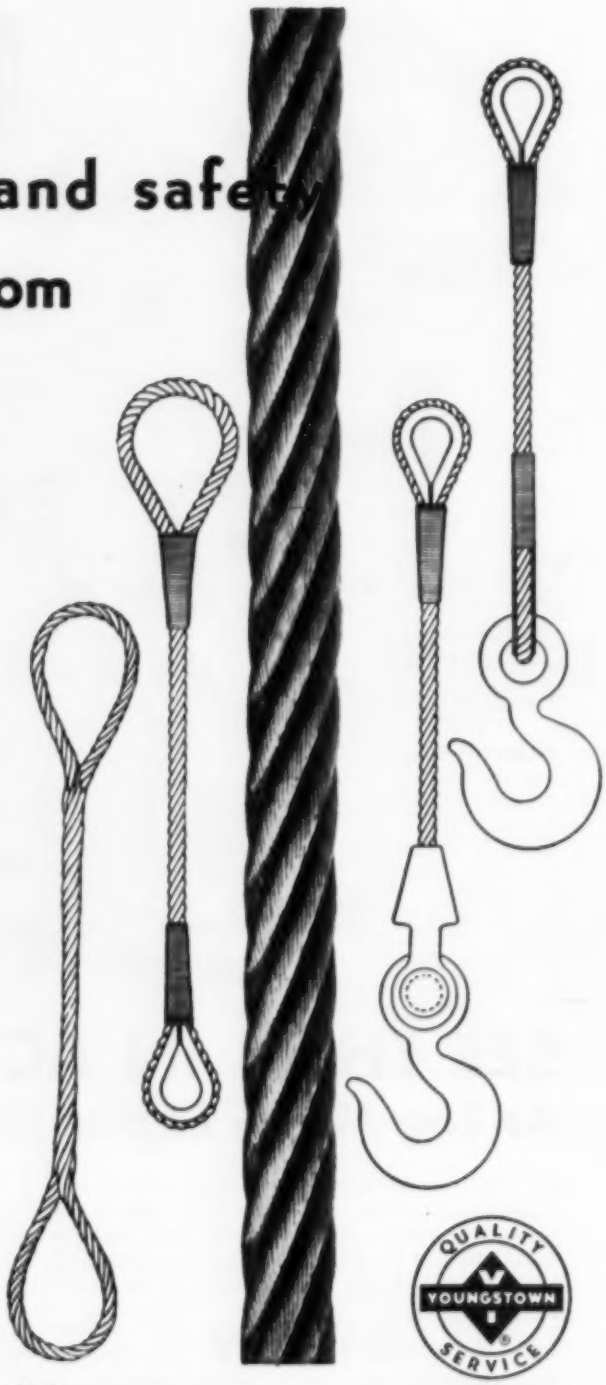
The brand new models described above, together with new clamps and other fork truck attachments, plus a host of other modern fork, platform and crane trucks, will be demonstrated under simulated working conditions. You'll be sure to see plenty of cost-cutting ideas.

THE **ELWELL-PARKER** ELECTRIC COMPANY
4103 ST. CLAIR AVENUE • CLEVELAND 3, OHIO

50th year MANUFACTURING INDUSTRIAL TRUCKS ELPAR

If you're not attending the show, send for the special "Golden Anniversary" Truck Folder.

Where strength and safety count, rope wire from Youngstown does the job!



Long experience in the manufacture of wire rope and rope fittings has taught Upson-Walton all the ins-and-outs of this business. Theirs are quality products, long noted for strength and safety. And, these qualities of strength and safety become inherent in Upson-Walton products with the selection of the basic material: Youngstown Yolectro Rope Wire.

For, Youngstown offers the most vital requirement of wire for wire rope—that of uniformity. Controlled and painstaking steel processing are the reasons why; extra strong and flexible rope wire, easy to form and yet tough enough to meet the approval of the most critical rope manufacturers and users is the result.

Youngstown Bright and Galvanized Yolectro High Carbon Rope Wire is furnished in all AISI grade designations. Phone or write our nearest District Sales Office

QUALITY YOUNGSTOWN SERVICE

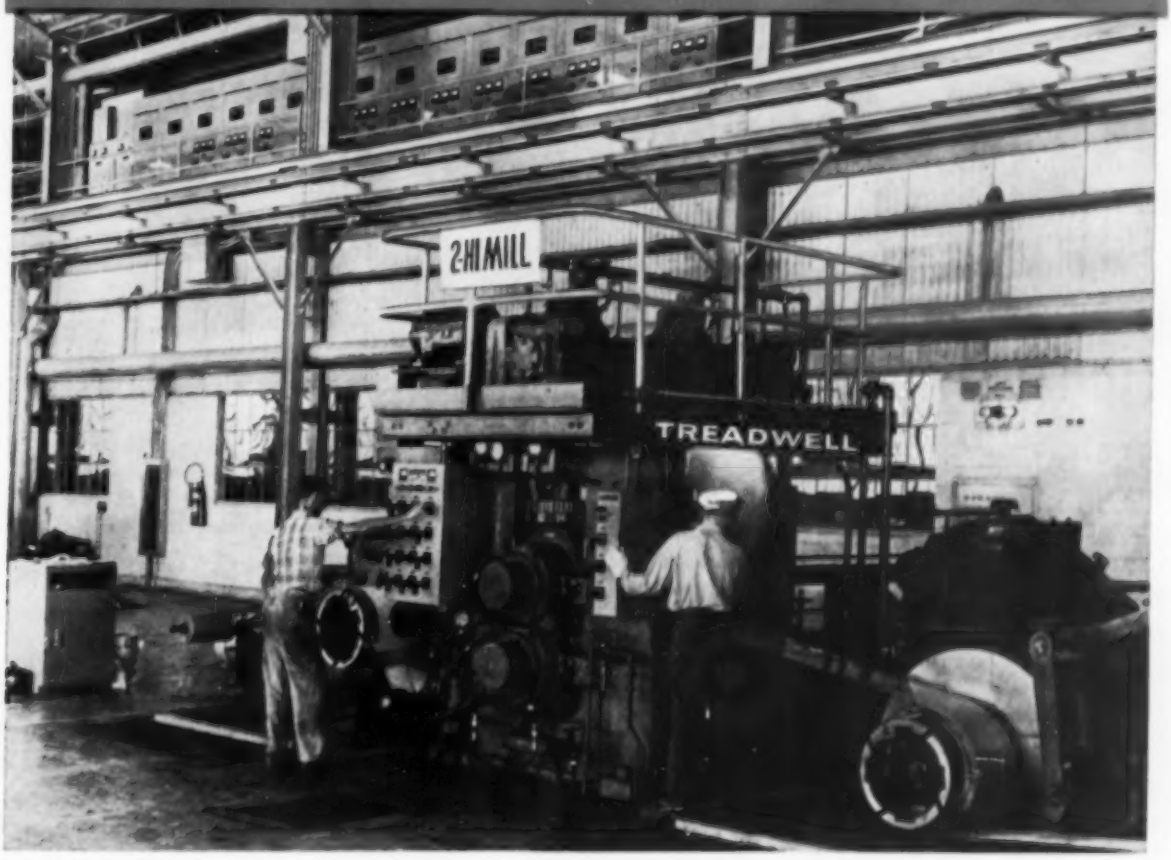
Youngstown YOLECTRO HIGH CARBON ROPE WIRE

THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices Youngstown, Ohio District Sales Offices in Principal Cities.

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - BLACK PLATE - RAILROAD TRACK SPIKES - MINE ROOF BOLTS

Treadwell



Temper or skin pass and cold rolling mills for high carbon, stainless and carbon steel strip complete with coiling equipment.

Manipulators, Mill, etc.
Mills, Blooming & Billet
Mills, Merchant & Bar
Mills, Rod
Mills, Sheet
Mills, Strip (Cold)
Mills, Strip (Hot) & Skelp
Mills, Vertical Edging

Tables, Mill
Tables, Tilting & Lift
Tables, Transfer
Transfers

Coilers & Reels
Conveyors, Coil
Drives
Ejectors, Furnace
Gauges, Shear, Saw, etc.

Beds, Cooling
Beds, Inspection
Bumpers, Furnace
Pushers, Furnace
Repeaters
Handling Equipment (Kick-offs, Pilers, Cradles, etc.)
Steel and Iron Castings
Ni-Hard and Ductile Iron Castings

BETTER GRADE MACHINERY

Treadwell Engineering Company

EASTON, PA.

SALES AND ENGINEERING OFFICES:

208 S. LA SALLE STREET
CHICAGO 4, ILL.
CEntral 6-9784

140 CEDAR STREET
NEW YORK 6, N. Y.
WOrth 4-3344

1015 FARMERS BANK BLDG.
PITTSBURGH 22, PA.
ATlantic 1-2883

ELIMINATE THE WORK HAZARDS
OF CHROMIC ACID MIST AND SPRAY

. . . use ZERO-MIST

The health hazard caused by mist and spray from chromic acid plating bath solution is eliminated when you use Udylite's Zero-Mist. Employees like it. City and state labor and health authorities like and recommend it. It is a boon to labor relations.

Beside eliminating mist and spray and improving working conditions, there are these direct benefits to your profitable operations—Saving the losses of valuable chromic acid in mist and spray—Additional large savings in the reduction of dragout losses—No need for water wash system installations—Gives added life to ventilating systems—Protects other solutions from mist and spray contamination.

Zero-Mist is a stable, surface-active additive for decorative chromium plating baths. It is unaffected by high temperatures. The concentration of Zero-Mist stays practically constant.

Zero-Mist is today a *must* in many plating operations. It will pay you to try it. Write us today for a test sample.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST
PLATING SUPPLIER

LETTERS
TO THE EDITORS

Editorial Arouses Curiosity

The Jan. 15, 1956, issue of *Sales Management* magazine contained an editorial discussing the shortage of engineers. Prominently mentioned was the "fascinating analysis" of STEEL, dealing with the engineers shortage.

The editorial has aroused my curiosity. I would appreciate receiving a reprint of STEEL's analysis for use both at home and at the office. Who knows but that your reprint may influence more young men to become salesmen.

E. H. Schaefer
Lighting Engineer
Special Services Sales Division
Wisconsin Electric Power Co.
Milwaukee

• *We are glad to forward a reprint of this story, "Unrest Among Engineers" (Dec. 26, page 29).*

Selecting a Copper

I think "How To Choose the Right Copper" (May 7, page 94) is the most informative article dealing with the selection of copper which I have run across. Please send a copy for my file.

P. H. Brotzman
Metallurgical Laboratory
Firestone Tire & Rubber Co.
Akron

This company is in the welding electrode business and, working with copper alloys as we do, this article was more than interesting. We would appreciate your sending an extra copy.

G. W. Smith
Plant Superintendent
W. W. Alloys Inc.
Division of Fansteel Metallurgical Corp.
Detroit

I feel this article would be beneficial to the trainees in our training program. We would like four reprints.

Donald A. Firchow
Kenosha Division Trainer
American Brass Co.
Kenosha, Wis.

Wanted: 3-In. Channel Producer

We have used your "Guide for Stainless Steel Buyers" since its publication in 1953. Recently, we were looking for a source for 3-in. channel and found none listed. Do you know who produces this item in 18-8 stainless?

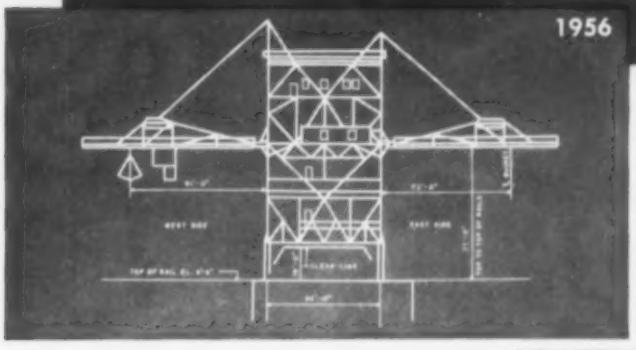
Also, is the 1953 edition of your guide the latest one published?

M. G. Maier
Purchasing Agent
Alaskan Copper & Brass Co.
Seattle

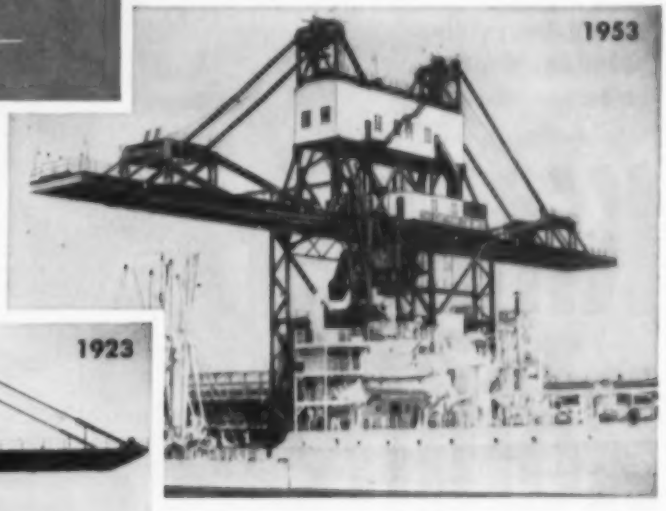
• *This product probably can be obtained only through negotiation with*

(Please turn to page 12)

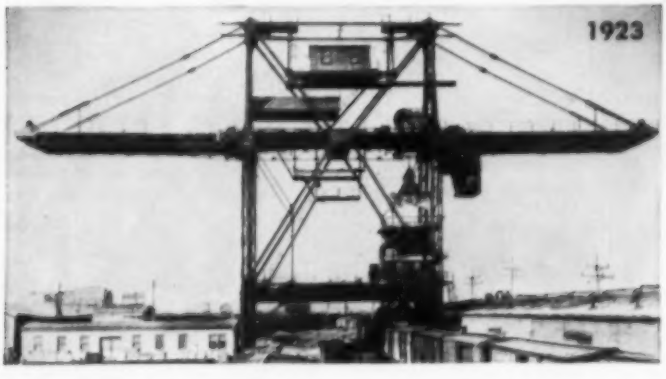
The Last 3 of 4 Boat Unloaders on the CANTON RAILROAD ORE PIER by HEYL & PATTERSON



No. 4 Boat Unloader by H & P, now being built, is almost a duplicate of the No. 3 Boat Unloader by H & P.

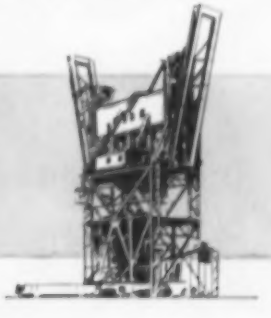


No. 3 Boat Unloader by H & P has been in operation since 1953.



No. 2 Boat Unloader by H & P has been operating since 1923 for The Cottman Company, Subsidiary of the Canton Co. of Baltimore, Md.

These three H & P unloaders located on the Canton Company Pier in Baltimore, are capable of unloading all kinds of ore directly into railroad cars or onto a high-line belt conveyor for remote loading into cars. All of these H & P unloaders are equipped with turntable trolleys to promote speedy cleanup, thus providing minimum turn-around time for both small and large carriers.



Heyl & Patterson INC.

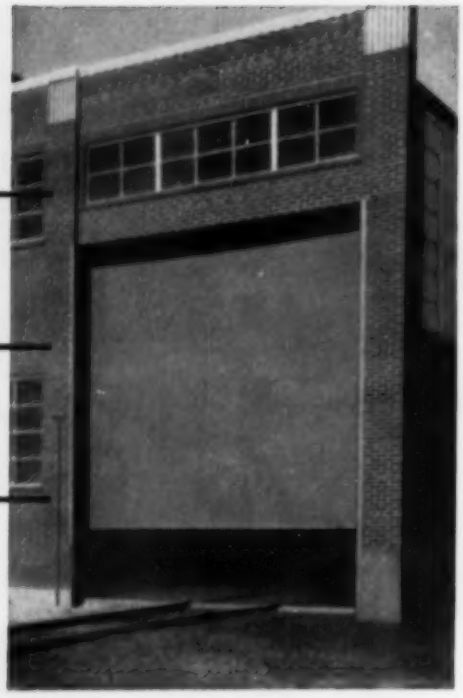
55 FORT PITT BLVD. • PITTSBURGH 22, PA.
PHONE COurt 1-0750

Doors open straight upward--no space is wasted anywhere

Maximum protection against theft, riot intrusion, vandalism

Every door is REGISTERED[1] for your protection

Extra-heavy zinc coating, for lasting weather resistance[2]

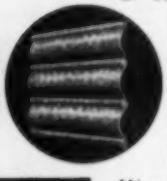


Kinnear Rolling Doors

You get *more* protection plus *more* efficiency in Kinnear Rolling Doors. Coiling above the doorway, they open out of the way! They never block light from closeby windows or fixtures. No floor, wall, or ceiling space is sacrificed. Hoists, conveyors, high-lift fork trucks and similar equipment can be used to maximum advantage.

1. Details on every Kinnear door are REGISTERED—kept in fire-safe vaults. Damaged or worn parts are *permanently* replaceable. Your Kinnear Door is never "orphaned."

2. Kinnear's rugged interlocking-slat curtain is heavily galvanized (1.25 ounces of pure zinc per sq. ft., A.S.T.M. Standards). In addition, the special Kinnear Paint Bond assures immediate, thorough coverage and adhesion of field-applied paint.



Kinnear Rolling Doors are engineered to fit any need, with manual-lift, crank, chain or electrical operation. Controls for motorized doors can be placed at any number of convenient spots. For long, low-cost service, insist on Kinnear Rolling Doors! *Write for catalog.*

The KINNEAR Mfg. Co.
FACTORIES
1780-1800 Fields Ave., Columbus 16, Ohio
1742 Yosemite Ave., San Francisco 24, Calif.

KINNEAR ROLLING DOORS
Saving Ways in Doorways

LETTERS

(Concluded from page 10)

a producer. You might contact the Joslyn Mfg. & Supply Co., 3700 S. Morgan St., Chicago 9, Ill., which produces channels of slightly smaller size, or U. S. Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa. A U. S. Steel catalog indicates special sections of stainless steel are available upon negotiation.

This is the most recent stainless steel guide we have.

Ideas for Rocket Research

I would appreciate receiving a copy of the report, "Ideas for Industry" (Apr. 23, page 105), No. 3 in the 1956 Program for Management. This division, which is engaged in the manufacture and testing of rocket engines, is now entering a fabulous growth period, and the information contained in your Management Series would be useful.

Lester J. Reed
Administrative Assistant
Rocketdyne
Division of North American Aviation Inc.
Canoga Park, Calif.

Avoid Pitfalls: Read STEEL

We have read the article, "What Specifications Mean to You" (April 16, page 92), and would appreciate your forwarding two copies. We believe this article would be helpful in eliminating possible pitfalls, and we would like to congratulate you on the way it was presented.

C. A. Wheeler
Vacuum Metals Corp.
Syracuse, N. Y.

This article is interesting. It is hoped more subcontractors take to heart these words of advice. Correct interpretation of all the details of government specifications will save some poor soul from a high reject loss.

Three reprints would be appreciated.

L. H. Adam
Pitman-Dunn Laboratories
Frankford Arsenal
Philadelphia

Retired Steelman Speaks Up

STEEL comes to me regularly, and I enjoy it since it is my only contact with the industry and the people I have known so well for many years.

I give my copies to retired steel fellows who read them like a kid reads Davy Crockett. Then, I get a kick out of knowing what is going on when visitors from the North start to tell me what is going on in the world.

Walter S. Doxsey
611 Smallwood Circle
Clearwater, Fla.

• *Mr. Doxsey for years was president of the American Steel Warehouse Association, with headquarters in Cleveland.*

Weirzin's tightly bonded zinc coating takes the deepest draws with ease—does not crack, peel or flake under the severest fabricating operations.

Weirzin's malleable zinc coating lubricates dies without leaving a zinc deposit—reduces die maintenance—increases die life.

Weirzin, chemically treated, takes and holds paint, enamel, lacquer and lithographic ink indefinitely—eliminates underfilm corrosion.

Weirzin stops inventory losses due to rust—eliminates pickling—reduces cleaning and buffing—cuts handling before, during and after fabrication.

How to wrap up product superiority...at lower cost

Weirzin

electrolytic zinc-coated sheet

No matter how extreme the stresses of fabricating operations, electrolytic zinc-coated Weirzin stands up under them. Its tightly bonded malleable coating flows so smoothly with the ductile steel base during a deep draw that Weirzin seldom needs additional coating for corrosion protection.

Here is a different kind of steel sheet. For ease of fabricating, for durability, for long-range economy, no other "similar" metal measures up to Weirzin. Weirzin is produced in c continuous strip up to 36" wide. It is available in coils or cut lengths down to ½" strip—gauges .010 to .0478. Phone or write now for the money-saving, customer-pleasing facts about Weirzin!

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

get these first-hand reports of profitable bulk-material handling methods

Roll-back bucket action does 1/3 more work at OHIO STOVE CO.

Before buying these two model HA "PAYLOADER" units for its foundry, Ohio Stove Company tried other equivalent-size loaders. In their own words, "the 'PAYLOADER' came way out on top. The two new design HA's with roll-back buckets are doing better than ⅓ more work than machines without roll-back action."

Ohio uses these machines to handle hundreds of tons of sand and castings daily—to scoop up sand and castings from all over the pouring floor, delivering the mixture to the shake-out in ton loads . . . also use them to deliver sand to molder's stations.

Versatility pays off at MUELLER BRASS CO.

The usefulness of a "PAYLOADER" is only limited by the imagination of its owners. Designed primarily for fast handling of bulk or loose materials, it nevertheless is a jack of all jobs in many plants. Mueller Brass Co. uses its model HA's to unload trucks and car loads of brass and copper scrap and turnings—to handle drums and baled material—to remove snow . . . in fact, for all sorts of odd but important jobs in addition to the regular sand handling duties in its foundry.

More than 35 years of experience in tractor-shovel design and application has been built into "PAYLOADER" units by The Frank G. Hough Co., originators of the unit-design tractor-shovel. It is this vast experience and knowledge incorporated into the design of each "PAYLOADER" model that makes the big difference in its superior performance on any job.

The new "PAYLOADER" Models HA and HAH include many exclusive features which pay off in greater output per hour. They are small and compact for easy maneuvering and handling in close quarters, yet have ample dumping height for most any job. The 40° bucket roll-back gets full loads fast and, combined with the hydraulic shock absorber, enables the "PAYLOADER" to carry full loads in a higher gear without spillage. These two features are BIG reasons why these machines give more production than heavier machines with bigger engines.

The full-reversing transmission and torque converter provide a wide range of easily obtainable speeds and maximum efficiency in handling each load. Extremely rugged construction . . . finest quality in each component—assures continuous performance with a minimum of "down-time" and a longer useful life.

It's the difference in performance that has made the "PAYLOADER" the decided choice in thousands of plants throughout the world—there are more in service today than all other makes combined. A "PAYLOADER" is your best investment now—and for the future.

PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY

THE FRANK G. HOUGH CO.
876 Sunnyside Ave., Libertyville, Ill.

- ☐ Send profitable bulk-handling reports
- ☐ Literature on model HA (1½ cu. ft.) and model HAH (1 cu. yd.) "PAYLOADER"
- ☐ Literature on larger units to 2¼ cu. yd.

Name _____
Title _____
Company _____
Street _____
City _____
State _____

If your sawing costs are mounting because you're not getting consistent low-cost operation, maximum production, and minimum downtime, call your Victor Distributor. He's the man who can bring your costs down to eye level. Once he's listened to your troubles, he'll recommend the *right* Victor Hand and Power Hacksaws, Metal and Wood Cutting Band Saws, and Hacksaw Frames for all your needs.

Your Victor Distributor will especially want to tell you about Victor "Moly"® High Speed steel blades. He'll tell you that "Moly" blades can save you real money because they outlast standard steel blades 10 to 1, cut as well as the *best* high speed steel blades made, and yet are substantially lower in cost!

And be sure to ask your Victor Distributor for a supply of our NEW Metal Cutting Booklets and Wall Charts. They're packed full of interesting information.

Sold Only Through Recognized Distributors

© 1960

VICTOR

SAW WORKS, INC., MIDDLETOWN, N.Y., U.S.A.
MAKERS OF HAND AND POWER HACKSAW BLADES, FRAMES, AND METAL AND WOOD CUTTING BAND SAW BLADES

STEEL
The Metalworking Weekly

Editor-in-Chief, IRWIN H. SUCH

Editor, WALTER J. CAMPBELL

Associate Managing Editors, VANCE BELL, JOHN S. MORGAN

WILLIAM M. ROONEY ..... *Market Editor*
J. D. KNOX ..... *Steel Plant Editor*
HARRY CHANDLER ..... *Copy Editor*
ALLEN G. GRAY ..... *Technical Editor*
ROBERT F. HUBER ..... *Machine Tool Editor*

FRANK R. BRIGGS ..... *Associate Editor*
ROBERT O. JAYNES ..... *Associate Editor*
VAN CALDWELL ..... *Associate Editor*
MICHAEL A. L. WEBSTER ..... *Associate Editor*

AUSTIN E. BRANT ..... *Assistant Editor*
BYRON E. KENNEL ..... *Assistant Editor*
ROSS WHITEHEAD ..... *Assistant Editor*
JOHN R. BOTEUM ..... *Assistant Editor*
GLENN W. DIETRICH ..... *Assistant Editor*
MARY T. BORGERHOFF ..... *Assistant Editor*
MARY ALICE LYMAN ..... *Assistant Editor*
EILEEN CORTES ..... *Assistant Editor*

MARY ANN STUVE ..... *Editorial Assistant*
JUNE TUTTLE ..... *Editorial Assistant*

THOMAS H. BRYAN, TOM WELSH, *Art Editors*
BEVERLY CLINE ..... *Editorial Service*

Resident Editors

New York 17 ..... 60 E. 42nd St.
B. K. PRICE, L. E. BROWNE
STANLEY B. STEWART
Murray Hill 2-2581

Chicago 11 ..... 520 N. Michigan Ave.
ERLE F. ROSS, WILLIAM E. DEAN
Whitehall 4-1234

Pittsburgh 19 ..... 2837 Koppers Bldg.
ROBERT M. LOVE
Atlantic 1-3211

Detroit 26 ..... 1249 Washington Blvd.
A. DONALD POSTMA
Woodward 3-3488

Washington 4 ..... 1123 National Press Bldg.
JAMES P. MORRISSEY
Executive 3-6849

London, 2 Caxton St., Westminster S. W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham ..... R. W. KINCEY
Birmingham 3-1121

Buffalo ..... GEORGE E. TOLES
Emerson 5385

St. Louis ..... HAMILTON THORNTON
Jackson 1-9281

Youngstown ..... GEORGE R. REISS
Riverside 7-1471

Los Angeles ..... NORMAN LYNN
Webster 5-3040

San Francisco ..... EDWIN HAVERTY
Yukon 6-5151

Seattle ..... R. C. HILL
Melrose 1895

Cincinnati ..... DICK HAVLIN
Beechmont 1-9607

Toronto, Canada ..... F. S. TOBIN
Empire 4-9655

Birmingham, England ..... J. A. HORTON

Paris, France ..... LEON JAUDOIN-PROM

Brussels, Belgium ..... PAUL DE KEYSER

Dusseldorf, Germany ..... DR. HERBERT GROSS

BUSINESS STAFF

Advertising Director ..... H. G. ROWLAND
Advertising Service Mgr. DORIS MITCHELL
Production Manager ..... A. V. ANDERSON
Promotion Director ..... S. F. MARINO
Classified Advertising ..... EVELYN DIETZ

Marketing Director ..... D. C. KIEFER
Circ. & Research Dir. ..... N. R. LADABOUCHE
Circulation Manager ..... G. R. EBERSOLE
Direct Mail Service ..... AMY LOMBARDO
Reprints ..... JUNE SCHILENS

Advertising Representatives

New York 17 ..... 60 E. 42nd St.
K. A. ZOLLNER, GUY LABAW
Murray Hill 2-2581

Philadelphia ..... 200 Wynnewood Ave.
Wynnewood, Pa.
WM. J. VERSCHOOR—Midway 2-6512

Farmington, Conn. ..... 12 Farmstead Lane
CALVIN FISHER JR.—Orchard 7-1756

Rochester, N. Y. ..... 217 Ridgeview Dr.
East Rochester, N. Y.
HAROLD A. DENNIS—Browning 2105

Pittsburgh 19 ..... 2837 Koppers Bldg.
J. C. SULLIVAN—Atlantic 1-3211

Cleveland 13 ..... Penton Bldg.
J. K. GILLAM, WM. J. D'ALEXANDER
Main 1-8260

Cincinnati 6 ..... 2215 Victory Pkwy.
E. L. FRANKS—Parkway 1-0711

Detroit 26 ..... 1249 Washington Blvd.
C. A. TALLINGER JR.—Woodward 3-3488

Chicago 11 ..... 520 N. Michigan Ave.
L. C. PELOTT, W. L. POLAND
Whitehall 4-1234

Los Angeles 48 ..... 6262 Commodore Sloat Dr.
F. J. FULLER—Webster 1-6565

San Francisco 4 ..... 57 Post St.
Robert W. Walker Co.
Sutter 1-5568

Griffin, Georgia ..... 1106 Pine Valley Rd.
FRED J. ALLEN—Griffin 7854

BPA

NBP

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, O.
MAin 1-8260

GEORGE O. HAYS ..... *President*
RUSSELL C. JAENKE ..... *Executive Vice President*
FRANK G. STEINEBACH ..... *Vice President and Secretary*
FRANK O. RICE ..... *Vice President*
JOSEPH P. LIPKA ..... *Treasurer and Assistant Secretary*

Also Publisher of
FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST, AUTOMATION

Member of Business Publications Audit of Circulation Inc., Society of Business Magazine Editors and National Business Publications Inc.

Pattern Design Strip—"Thomas Strip is the only company that can supply our requirements for Pattern Design plated strip," says an official of Milwaukee's M. A. Gerett Corp., world's largest manufacturer of fine coin banks like those shown above in assembly. Thomas' lacquered copper, brass and nickel coated strip cut M. A. Gerett's rejection rate 7 percent. Piece buffing at Gerett was eliminated through adoption of Thomas' Pattern Design Strip. Die life increased, too, because the strip's coating acts as a lubricant during the forming operation, yet doesn't crack.

Brass—Gleaming brass coated strip from Thomas offers manufacturers electrolytically pre-coated steel with a finish that can be oxidized readily to a variety of shades. Subsequent lacquering gives an attractive and permanent final product finish. Here is steel's strength and economy with the advantages of brass. It protects parts-in-process against corrosion and lends itself readily to production of small stampings, drawn parts, tubing and roll-formed sections. Available in natural, planished and buffed finishes in a variety of widths, tempers and gages.

COLD ROLLED STRIP STEEL

You Can Bank On Saving Money With Thomas Strip's Pre-coated Steel

Manufacturers using Thomas Strip —pre-coated with zinc, copper, brass, nickel, tin or lacquer—are piling up big dollar savings.

These fabricators are reducing their production costs . . . stretching supplies of hard-to-get, expensive metals . . . and making their finished products more competitive and attractive.

Pre-coated steel specialties from the Thomas Strip Division of Pittsburgh Steel Company come to you already electroplated with zinc, copper, brass or nickel. Or you can get them hot dip coated with lead alloy or tin. Natural, planished or buffed finishes are available. Lacquer coatings are furnished in a full range of colors or in clear lacquer. Thomas also can supply you close tolerance plain steel strip in a variety of tempers, grades and finishes.

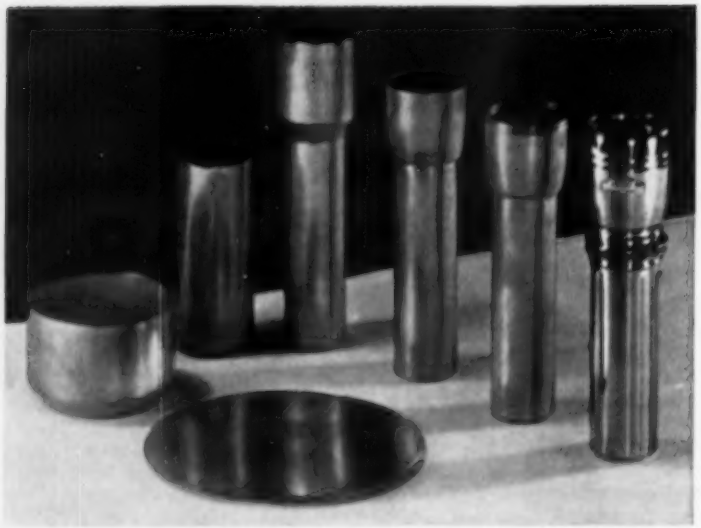
Thomas Strip has long been recognized for precision rolling to extremely close tolerances in gages down to .004 inch and up to 22 inches in width. Tempers include 1, 2, 3, 4 and 5, or special tempers as required. You can get Thomas Strip in oscillated or ribbon-wound coils or in cut lengths. A choice of edges is available to meet your exact specifications.

Don't overlook the possibilities of Pattern Designed rolled strip which Thomas produces in an almost unlimited variety of patterns in coated and uncoated finishes. Turn the page to see how other manufacturers are cutting costs with Thomas Strip products.

Nickel Coated Strip—Loose Leaf Metals Co. of St. Louis is one of the largest manufacturers of metal hardware for binders and loose leaf books. Photograph shows production of a metal part for a first grade ring metal. President George A. Ober says: "We have never experienced a flaky surface on a Thomas product. We've come to know Thomas will not ship until its product is right, therefore, we have never had to reject their materials." Thomas is a major supplier of cold rolled nickel, copper, tin, zinc and lacquer coated steel.

Plain Steel—Bright uncoated steel strip in low carbon, alloy and spring steel grades, has uniformity of temper, gage and finish. Above, plain cold rolled steel passes through a temper mill at the Thomas Strip plant. In addition to high finishes, Thomas Strip is available in dull and regular finishes, in coils or cut lengths—in a choice of edges—and a range of specifications.

Here's Why You Cut Costs With Thomas Strip



Copper Coated Strip—Here's the evolution of a Ray-O-Vac flashlight—from electroplated copper strip, produced by Thomas Strip, to the finished product. Blake Manufacturing Division of Ray-O-Vac Company at Clinton, Mass., changed from brass to steel for this and other flashlight cases. Production savings from 17 to 29 percent resulted. Ray-O-Vac uses a .020 gage, non-scalloping, deep drawing quality strip steel produced by special processing techniques. The steel is electro-copper coated on both sides, and is 6⅛ inches wide. On three popular models alone, the savings amounted to more than $100,000 in one year.

- **Thomas Strip Fabricates Easily**—Coatings stand fully as much fabrication as the easy-to-work base steel.
- **Die Life Is Lengthened**—Most coatings lubricate dies, reduce wear.
- **Gives Maximum Pieces Per Pound**—Because Thomas Strip is rolled to extremely close tolerances, you get the maximum number of parts per pound of metal.
- **Cuts Plating Costs**—Thomas coatings can serve as a final product finish or as a prepared base for further plating or painting.
- **Your Manufacturing Processes Are Streamlined**—Ready-to-fabricate Thomas Strip streamlines your manufacturing processes to two essentials—fabricating and assembly.
- **Extends Economy Of Steel To Many Parts**—Pre-coated Thomas Strip replaces more expensive metals.
- **You Can Begin To Save Today**—Experienced Thomas metallurgists and technicians are available now to help you with your steel problems. Their help is yours for the asking. Write or call any Pittsburgh Steel Company sales office.

Zinc—Long "strips" of Thomas zinc-coated steel hold the vegetable fiber in Fuller Brush Co.'s power-driven brushes shown above. In foreground is an industrial brush used to process plywood. The brush in the background is for an automobile washing machine. Although zinc-coated steel undergoes a severe deformation in forming machines, this Thomas product takes the punishment easily. The heavy, uniform coating of zinc remains undamaged, giving the brushes long life.

Tin Coated Strip—International Register Co. of Chicago, producer of electrical timing devices, made approximately a 20 percent saving when it switched to Thomas pre-coated strip. Tin coated strip, like that above, provides corrosion resistance to dials, gear case covers and other timer parts. Above, Ray Gabriel, International's Steel Buyer, shows Pittsburgh Steel representative Buck Mills a completed Intermatic Time-All appliance timer.

Lacquered Strip—"Nothing works as well on our machines as lacquered steel strip from Thomas," declares Max Haas, plant manager for Hinton Associates, Inc., of Staten Island, N. Y., manufacturer of Happiness Bird Cages. Hinton Associates processes blue or pink lacquered strip in the machine shown above to form a border for seed guards on its cages. Mr. Haas said: "We like Thomas lacquered strip because it doesn't break in forming machines or power presses. The zinc backing on the strip permits the rolls to get a good grip when the metal passes through our machines."

High Carbon—Thomas Strip's high carbon strip gets a tough test in the Toledo, Ohio, plant of Prestole Corp., manufacturers of steel fasteners. Prestole bends, twists, shears, punches and forms Thomas Strip's high carbon strip, as in the operation above. It has to have steel that's free of excessive burring, gives the finished fasteners the right springback and proper tension. Each coil must be uniform in chemical and physical specifications. "We've never had a complaint yet about Thomas quality," says Roy Gutzmer, plant manager.

Thomas Strip®

Division

Pittsburgh Steel Company

Grant Building · Pittsburgh 30, Pa.

District Sales Offices:

Atlanta	Columbus	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio
Cleveland	Dayton	Los Angeles	Pittsburgh	

Pumping Progress Report

FOR MECHANICAL ENGINEERS

An advertisement prepared by the Aldrich Pump Co., Member of Hydraulic Institute, U.S.A.

SPACE, in many pump installations, is a major problem. Another is the necessity for special foundations. When new installations are considered, these factors may dictate more elaborate construction than should be necessary. And for replacement or modifications of existing systems, they may require expensive piping and equipment changes.

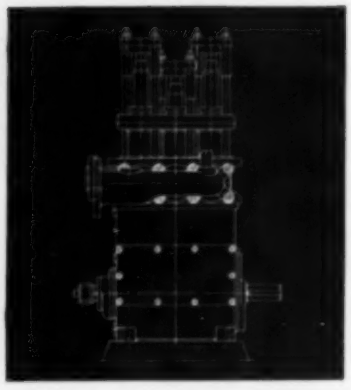
COMPACTNESS OF DESIGN, while often desirable, is not necessarily the answer. Simplicity of design — as in the case of ALDRICH Direct Flow Pumps — may be a better solution.

SIMPLICITY OF DESIGN brought about the first inverted Triplex and Quintuplex Pumps and ultimately Septuplex and Nonuplex Pumps. This Aldrich design innovation brought to pump users many economies of space, maintenance and operation they had never known.

INVERTED PUMP DESIGN permits the use of less expensive foundations. With the crankshaft located near the floor there is no need for expensive foundation work to raise the driver or lower the pump. Then, too, inverted pumps require fewer square feet of floor space than conventional pumps.

MAINTENANCE COSTS ARE REDUCED. Fluid-end, where most work is done, is at chest level. Bearing replacements are made without removing heavy crankshafts or connecting rods. Crossheads on all Direct Flow Pumps can be worked on or removed from pump without disturbing fluid-end.

TELL US ABOUT YOUR PUMPING PROBLEM. The chances are that one of our standard pumps — or a modification of one — will do your job. Detail your problem and we'll send you a copy of the Data Sheet that describes the Direct Flow Pump we recommend. Write to: The Aldrich Pump Company, 18 Pine Street, Allentown, Pa.



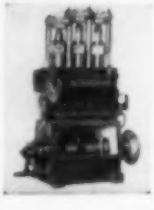
Aldrich inverted vertical pump design

...for your tough pumping problems specify ALDRICH

The entire line of Aldrich Direct Flow Pumps feature two outstanding design innovations—inverted vertical design and sectionalized fluid-ends. These two features have helped make Aldrich the organization hydraulic engineers turn to when they face tough pumping problems. If you have a pumping problem, turn it over to the men who have never turned down a challenge.

CHECK THESE ADVANTAGES OF INVERTED PUMP DESIGN:

Smaller Foundations
Simpler connection with prime mover
Less floor space required
Reduced maintenance costs



Write today for Data Sheets describing the Direct Flow Pump Series.

THE ALDRICH PUMP COMPANY

Originators of the Direct Flow Pump
18 PINE STREET
ALLENTOWN, PA.
Representatives in principal cities

This Plymouth Does A Year's Work In Six Months

. . . at Stiles & Hart Brick Co., Taunton, Massachusetts, where operations cease for the winter.

This Plymouth Locomotive, like all Plymouths, was made for continuous duty. So it makes up for its enforced hibernation during winter (when the plant is closed) by hauling enough clay to make over 72,000 brick daily, from April to September! "No time is lost for repairs or maintenance," reports Mr. J. Mansfield, Vice President, "and no trouble on the job!"

Plymouth power, economy, and dependability for any type of haulage is available in models from 3 to 70 tons, gasoline or Diesel, with mechanical or Torqomotive Drive* . . . also Diesel-Electrics.

Plymouth Locomotives and Torqomotives have a long history of dependable, cost-cutting performance in all kinds of industrial switching and hauling.

Get all the facts. Outline your haulage problem for an analysis by Plymouth engineers. Write to *Plymouth Locomotive Works, Division of The Fate-Root-Heath Company, Dept. A-1, Plymouth, Ohio.*

PLYMOUTH* TORQOMOTIVES

*TORQOMOTIVE DRIVE: Plymouth Transmission coupled to a Hydraulic Torque-Converter

ALSO BUILDERS OF F-R-H CERAMIC MACHINERY

in a new car . . .
in a used car . . .

stainless steel sells and re-sells

The Stainless Steel trim, molding and vital parts that add style and beauty to a car, inside and out, are features that help make the sale.

Stainless Steel has wide customer acceptance. It's easy to clean and keep clean. It's a tough, solid metal that will not corrode or dent and stands up to gravel, ice, salt and water.

The finish never fades and parts are easy to replace. Stainless Steel lasts the life of the car. It *sells* in a new car and it *re-sells* in a used car.

McLOUTH STAINLESS STEEL

for automobiles

McLOUTH STEEL CORPORATION
Detroit, Michigan

Manufacturers of Stainless and Carbon Steels

Galvanizing in 1965?

WEAN

advanced engineering will provide the answer

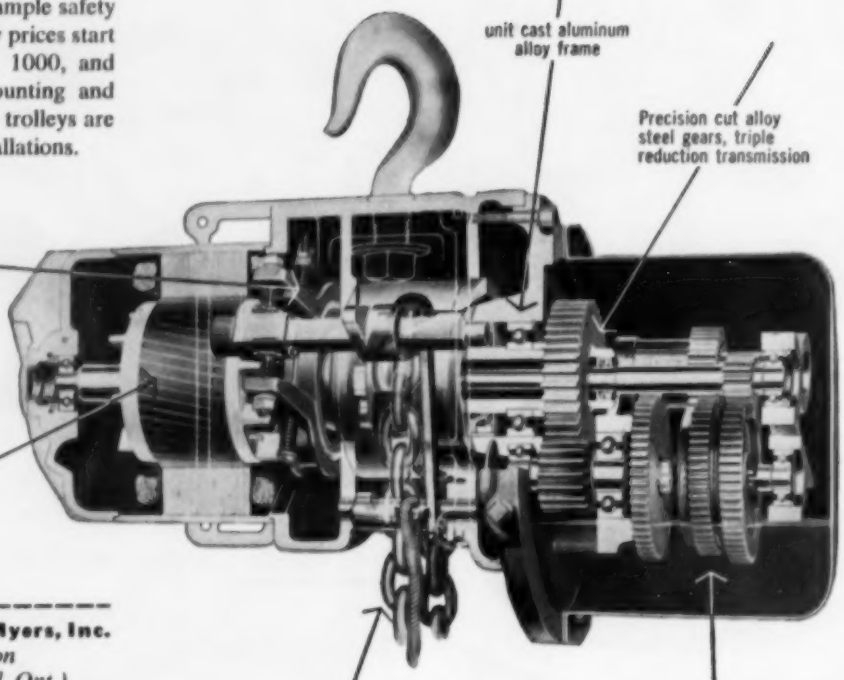
THE DEMAND for galvanized steel is constantly on the increase. This, of course, has resulted in a need for faster, more efficient galvanizing lines. In recent years, Wean has contributed greatly to the development of continuous lines for both hot dip and electrolytic galvanizing.

TO THIS END, Wean has brought together perhaps the finest group of mill equipment engineers in the nation. Their assignment: to constantly study galvanizing and keep Wean lines first and foremost in the industry. We believe the accumulated knowledge and the advanced engineering techniques of such an accomplished team will, as it has in the past, supply the answer to the question of galvanizing in 1956, 1970 or, for that matter, in the year 2000.

The WEAN ENGINEERING COMPANY, INC.
WARREN, OHIO

JC chain hoists are ahead of competition in quality—right with it in price. See for yourself why more value for the same money is yours in the JC. The ½ hp R&M heavy duty motor is equipped with an oversize shoe brake to assure quick stops, accurate load spotting, longer life. Separate load brake is Weston-type, with non-reversing clutch to prevent drift. Gearing—triple reduction precision cut alloy steel spur gears, heat treated. Running in sealed splash-oil bath, ball bearings, gears, and load brake are continually lubricated for maximum service life. The light-weight JC hoist can be moved easily, has ample safety factor. Immediate delivery. Low prices start at $207. JC available in 500, 1000, and 2000 lb. capacities. Hook mounting and rope control standard, but push trolleys are available for most I beam installations.

quality to spare


unit cast aluminum alloy frame
Precision cut alloy steel gears, triple reduction transmission
ample shoe type motor brake
R&M ½ hp hoist motor 30 minute, 55°C rating
welded alloy steel chain, withstands pull in any direction
Weston-type load brake with non-reversing clutch runs in oil

take it up with Robbins & Myers, Inc.
Hoist & Crane Division
Springfield, Ohio (Brantford, Ont.)
Send JC hoist bulletin. *(S)*

*Name*_____

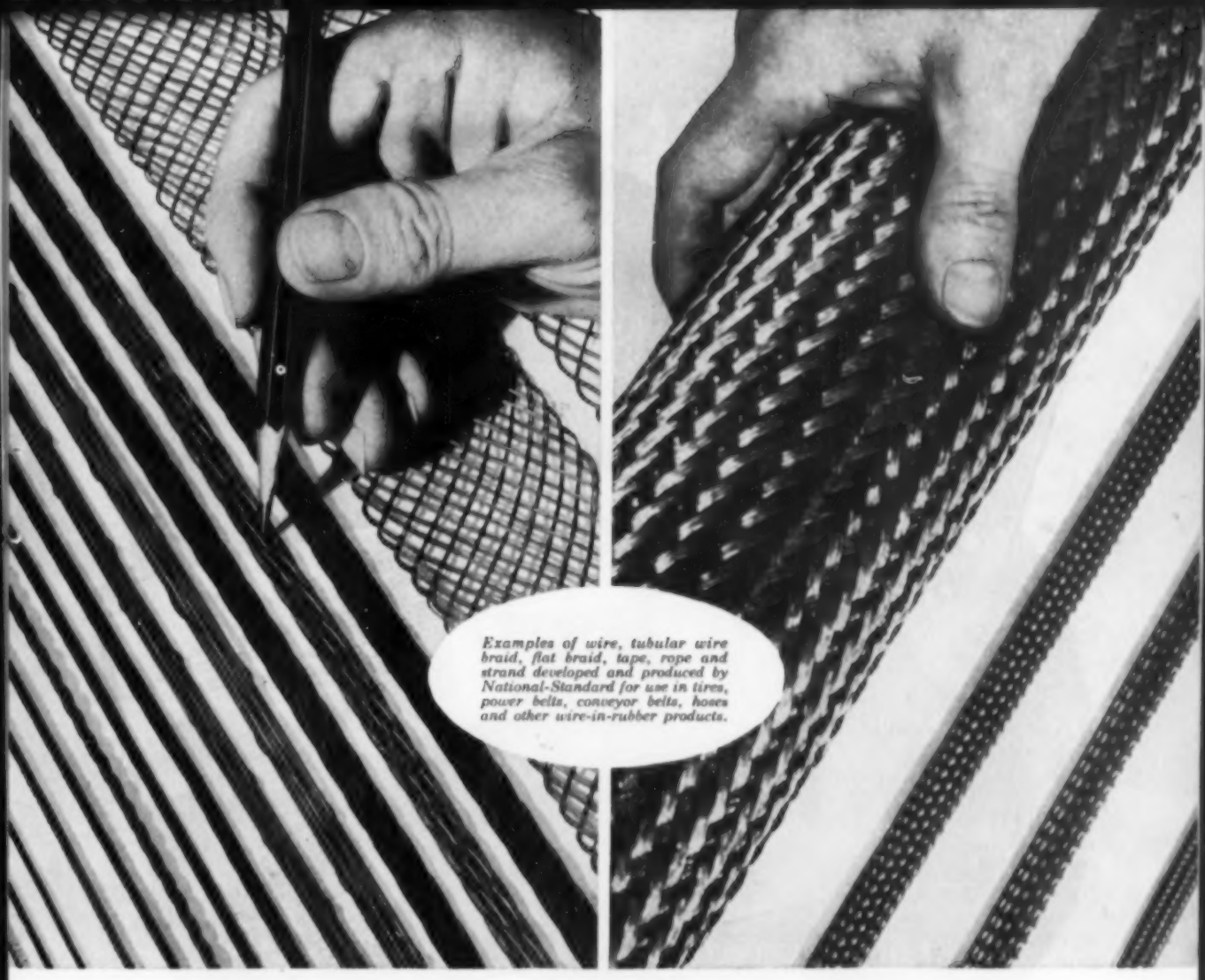
*Title*_____

*Company*_____

*Address*_____

BOOTH 1417

ROBBINS & MYERS **hoists • cranes • winches**



Examples of wire, tubular wire braid, flat braid, tape, rope and strand developed and produced by National-Standard for use in tires, power belts, conveyor belts, hoses and other wire-in-rubber products.

How product "X" might be improved

● Whatever you make, from cheese slicers to electronic brains, chances are wire of some kind in some form enters into your product make-up. Maybe it isn't special wire. Maybe it should be! In either case it is in this area that National-Standard service might help you produce a better product at lower cost.

For example, National-Standard has long devoted large scale research and engineering to improving the teamwork of wire and rubber—extensive work on wire fabrication, material, finish, corrosion, strength, elongation, adhesion and other factors that affect the behavior and cost of wire-in-rubber products.

You can draw on the fruits of all this and similar work performed for many other industries on the most effective use of wire.

So if you even suspect that a different or specially developed type of wire might improve your product or speed production, don't hesitate. Consult with National-Standard. We make a point of such service . . . want to be of help . . . and are geared to do it well, without obligation. Check with us now . . . or any time!

NATIONAL-STANDARD COMPANY • NILES, MICHIGAN
Tire Wire, Stainless, Fabricated Braids and Tape

ATHENIA STEEL DIVISION • CLIFTON, N. J.
Flat, High Carbon, Cold Rolled Spring Steel

REYNOLDS WIRE DIVISION • DIXON, ILLINOIS
Industrial Wire Cloth

NS
NATIONAL-STANDARD
Company
NILES, MICHIGAN

WAGNER LITHO MACHINERY • JERSEY CITY, N. J.
Special Machinery for Metal Decorating

WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

This 8-page illustrated booklet brings you up to date on the latest features in Waterbury Farrel's multiple station pillar presses. It explains the design improvements which provide greater efficiency, easier operator control, increased flexibility and economy of operation.

Includes complete table of specifications and capacities for six press sizes. Also covers accessory equipment such as straighteners, feeders, scrap winders, etc.

To get your copy, use the coupon or drop a line on your letterhead.

SOME OF THE MANY TYPES OF WATERBURY FARREL METALWORKING MACHINERY

POWER PRESSES — Crank, Cam and Toggle; also Rack and Pinion Presses • Eyelet Machines • Multiple Plunger Presses • Horizontal and Hydraulic Presses, etc. **MILL MACHINERY** — Rolling Mills: Strip, Rod, Wire Flattening, (For Ferrous and Non Ferrous Metals) • Also Slitters • Straighteners • Cut-off Saws • Coilers • Winders, etc. **WIRE MILL EQUIPMENT** — Continuous Wire Drawing Machines (Upright Cone and Tandem) • Wire Flattening Mills • Chain Draw Benches • Pointers • Swagers Bull Blocks • String-up Machines • Spoolers, etc. **COLD PROCESS BOLT & NUT MACHINERY** Headers (all types) • Rivet Machinery • Trimmers • Thread Rolling Machines • Slotters • Nut Formers and Tappers, etc.

WATERBURY FARREL FOUNDRY & MACHINE CO.
Waterbury, Connecticut
Branch Offices: Chicago, Cleveland and Millburn, N. J.

WF-20

WATERBURY FARREL FOUNDRY & MACHINE CO.
Waterbury, Conn.

Gentlemen: Please send me my free copy of your Multiple Plunger Pillar Press Booklet.

*Name*_____

*Company*_____

*Address*_____

*City*_____ *State*_____

CALENDAR OF MEETINGS

May 28-30, Wire Reinforcement Institute Inc.: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Institute's address: 1049 National Press Bldg., Washington 4, D. C. Managing director: Frank B. Brown.

May 28-31, National Fluid Power Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1618 Orrington Ave., Evanston, Ill. Secretary: Barrett Rogers.

May 28-June 2, Concrete Reinforcing Steel Institute: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Institute's address: 38 S. Dearborn St., Chicago 3, Ill. Managing director: H. C. Deinzil.

May 29-30, Steel Joist Institute: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Institute's address: DuPont Circle Bldg., Washington 6, D. C. Managing director: C. H. Luedeman.

June 1-3, Steel Kitchen Cabinet Manufacturers Association: Annual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

June 3-6, Automotive Engine Rebuilders Association: Annual meeting, Sherman hotel, Chicago. Association's address: 419 N. Capitol Ave., Indianapolis 4, Ind. Executive vice president: R. G. Patterson.

June 3-6, American Gear Manufacturers Association: Annual meeting, Homestead, Hot Springs, Va. Association's address: One Thomas Circle, Washington 5, D. C. Executive secretary: John C. Sears.

June 3-8, Society of Automotive Engineers Inc.: Summer meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

June 4-7, National District Heating Association: Annual meeting, Inn and Lodge, Williamsburg, Va. Association's address: 627 N. Euclid Ave., Pittsburgh 6, Pa. Secretary-treasurer: John F. Collins Jr.

June 5-8, Material Handling Institute Inc.: Material handling exposition, Public Auditorium, Cleveland. Institute's address: One Gateway Center, Pittsburgh 22, Pa. Managing director: R. Kennedy Hanson.

June 6-8, American Society for Quality Control: Annual meeting, Mt. Royal hotel, Montreal, Que. Society's address: 50 Church St., New York 7, N. Y. Secretary: C. E. Fisher.

June 7-8, Society for Advancement of Management: National small business conference, Hotel Statler, New York. Society's address: 74 Fifth Ave., New York 11, N. Y. Executive vice president: Harold L. Bixler.

June 7-8, Machinery & Allied Products Institute: Annual meeting, Hotel Statler, Washington. Institute's address: 1200 18th St. N.W., Washington 6, D. C. Secretary: Charles I. Derr.

June 7-9, Electric Metal Makers Guild Inc.: Annual meeting, Onesta hotel, Canton, O. Guild's address: Box 6026, Mt. Washington Station (11), Pittsburgh, Pa. Secretary: A. C. Ogan.

June 7-10, National Metal Trades Association: Western plant management conference, Dell View hotel, Lake Delton, Wis. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

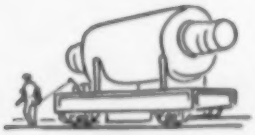
June 11-12, Malleable Founders' Society: Annual meeting, Homestead, Hot Springs, Va. Society's address: 1800 Union Commerce Bldg., Cleveland 14, O. Secretary: Lowell D. Ryan.

June 11-15, Society of the Plastics Industry Inc.: National plastics exposition, Coliseum, New York. Society's address: 67 W. 44th St., New York 36, N. Y. Executive vice president: William T. Cruse.

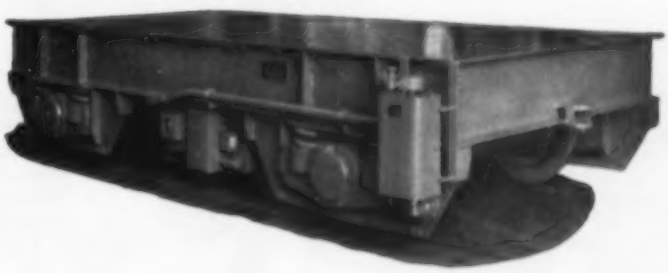
June 12-14, Radio-Electronics-Television Manufacturers Association: Annual meeting, Edgewater Beach hotel, Chicago. Association's address: 777 14th St. N.W., Washington 5, D. C. Secretary: James D. Secrest.

June 17-21, American Electroplaters Society: Annual meeting, Hotel Statler, Washington. Society's address: 445 Broad St., Newark, N. J. Secretary: P. P. Kovatis.

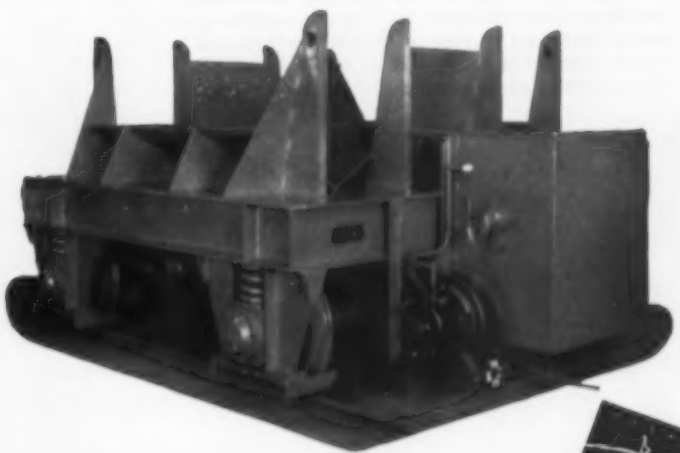
TRANSFER IT SAFELY
at Less Cost with
ATLAS



Atlas Safety-Type Transfer Cars are outstanding for moving heavy materials over short distances. Designed for storage battery, diesel or gas-electric, or cable reel service. Only one simplified control lever for safety. The car moves only when the operator holds the lever.



50-TON STORAGE BATTERY FLAT CAR



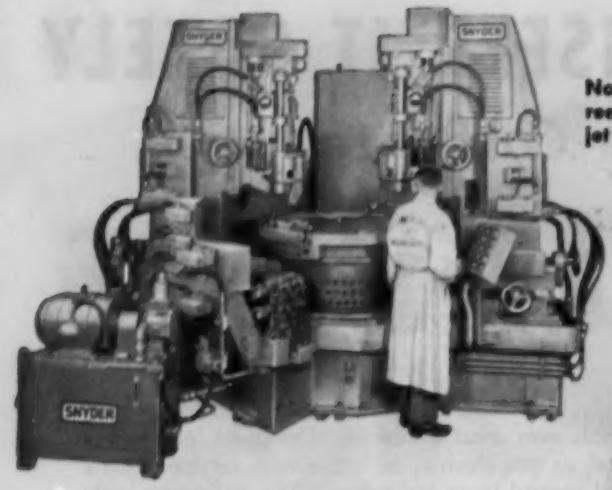
64-TON ELECTRIC FLAT CAR

Request "Walk-Along" Bulletin 1283

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS

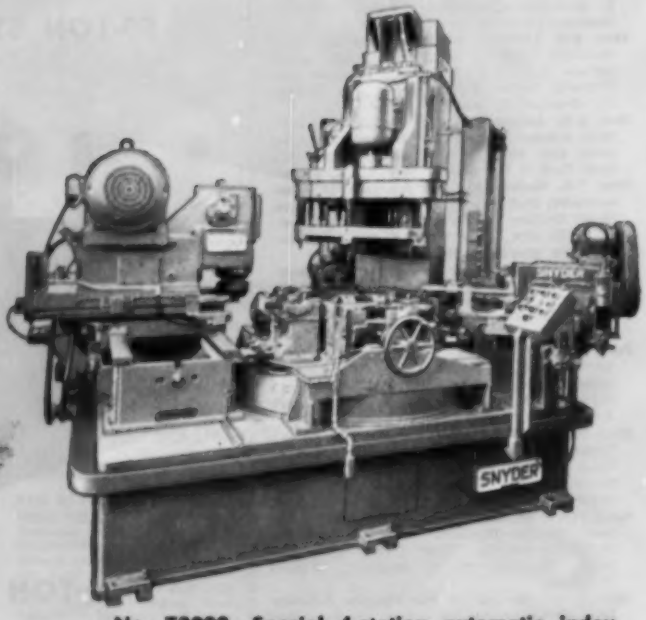
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.



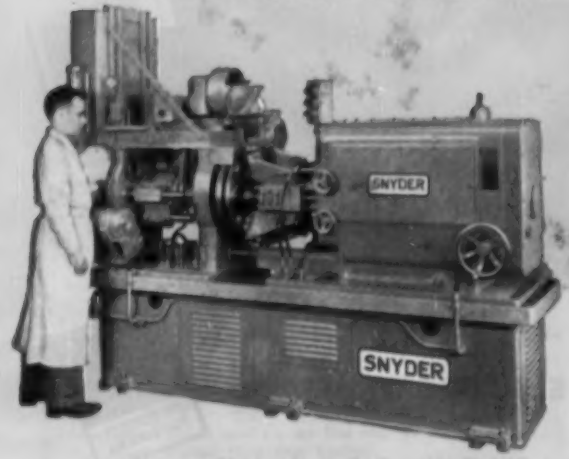
No. 70165—Special index machine to drill and ream holes in rims of outer shroud spacers for jet engines. Production 2 parts per hour.

No. 65412—Special automatic machine, for weighing and precision balancing a variety of heavy-duty and diesel engine connecting rods from 7⅝" to 12" center distance. Weighs rods and automatically balance mills to plus or minus 2 grams.

No. 207390—Special, double-end precision boring machine for finish boring, counterboring and chamfering counter shaft, intermediate and shifter shaft holes on power take-off cases. Production 82 pieces per hour at 80% efficiency.



No. 73902—Special 4-station automatic index machine for milling joint face, drilling and reaming vertical and horizontal holes in exhaust manifolds. Production 80 pieces per hour at 80% efficiency.



No. 68526—Special double end trunnion machine, fully automatic, for machining special aircraft rivets. Machine is automatically loaded and unloaded. Production rate varies with size of rivet.

SNYDER VERSATILITY

in engineering and building metal-cutting machines includes not only the great Snyder line transfer machines with automation, but also many smaller and diversified machines in which the standards of performance and economy are no less exacting. A few representative examples are shown.

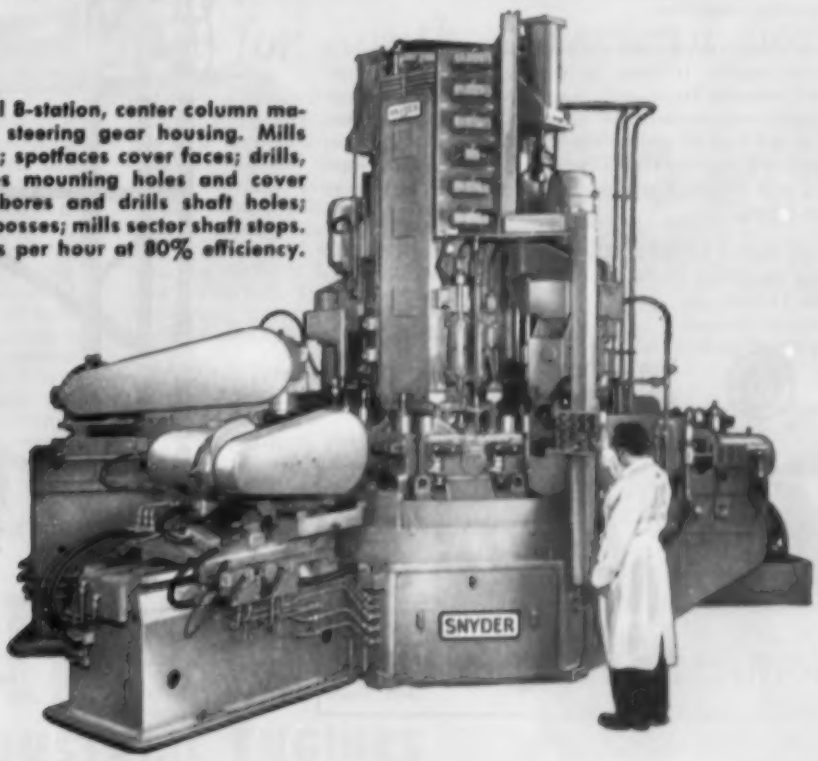
SNYDER

TOOL & ENGINEERING COMPANY

3400 E. LAFAYETTE • DETROIT 7, MICHIGAN

31 Years of Special Machine Tools with Automation

No. 72976½—Special 8-station, center column machine for processing steering gear housing. Mills pads and cover faces; spotfaces cover faces; drills, countersinks and taps mounting holes and cover holes; rough counterbores and drills shaft holes; mills two Welch plug bosses; mills sector shaft stops. Production 260 pieces per hour at 80% efficiency.



Concentrated Heat for Industry*

Scientists and engineers have done a tremendous amount of work, over the past 10 years, with new techniques in burning fuels. Most of their work has been aimed at the goal of making airplanes and rockets fly faster. Now, as this illustration shows, industry is picking up some of the techniques for its own use.

and smaller area can pay off in the operations of several industries. But as it stands, a jet turbine's ... too rich for a pi... bine's f...

...built around *Carpenter* Stainless Tubing for Long Life!

This unique type compact heat exchanger has found ready acceptance as a highly efficient and dependable source of hot air or gas at pressures up to 300 psi and temperatures to 1200°F. Carpenter Stainless Tubing met every requirement of the manufacturer—superior strength at high pressures and temperatures, easy fabrication, uniform expansion, oxidation resistance and long, maintenance-free performance. That's why Carpenter Stainless Tubing is used exclusively for the straight tube and coiled fin-tube bundles, both shown at right partially assembled.

Any heat transfer equipment worth building or using is worth Carpenter quality. It costs no more . . . because all full-finished Carpenter Stainless Tubing meets the high and uniform quality requirements for heat exchanger applications. And you are sure of getting the highest possible degree of perfection in Carpenter tubing because it must pass the most exacting and thorough non-destructive test ever applied to stainless tubing.

Call your nearest Carpenter Distributor or Branch Office to give your equipment the benefit of better-than-ever Carpenter Stainless Tubing.

MEMBER

The Carpenter Steel Company, Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N.Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

*from BUSINESS WEEK of January 22, 1955

success story

PHOTO COURTESY THE MERCURY MANUFACTURING COMPANY, CHICAGO, ILLINOIS

Modern powered equipment cuts unloading time in half—saves traffic for South American port

Callao, Peru – largest port in South America – was in trouble. Facilities for unloading, moving and warehousing ships' cargoes were outmoded and inadequate. Ships with grain and general cargo were delayed five to ten days unloading.

At dockside, a narrow gauge railway was the principal means of moving cargo into warehouses. But because of the inflexibility of this system of handling, cargo was dumped at a central point in the warehouse to be removed later to assigned storage area. Moreover, unloading operations were frequently halted while stevedores waited for the switch engine to return empty freight cars.

A serious reduction in port traffic might have resulted had not the Peruvian Government acted. A pallet rack system was installed and a number of Chrysler-powered Mercury towing tractors were brought in to replace the old switch engine and single gauge track.

Now Mercury "Huskies" and "Super Huskies" move palletized cargo from dock to allotted space in warehouses, pick up a load of empty trailers and return to the dock. Unloading time has been cut in half. The addition of Mercury towing tractors and other new unloading and warehousing equipment has made Callao today one of the world's most modern ports and—best of all—ships now are unloaded in one or two days.

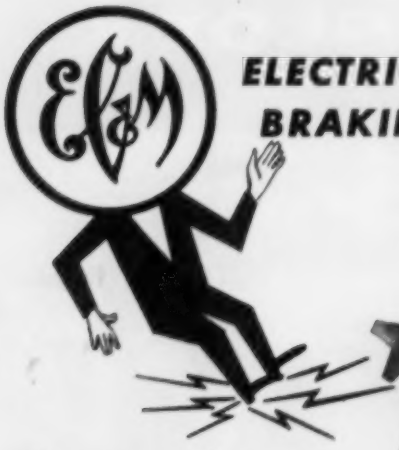
This kind of "success story" requires equipment powered with dependable, high-speed engines. Mercury has it in the Chrysler Ind. 32, 265 cubic inch displacement engine powering both the "Huskie" and "Super Huskie." A Chrysler-supplied four-speed transmission and power take-off completes the power package.

If your equipment is not Chrysler-powered, you may not be getting all it can deliver. Check the nearest Chrysler Industrial Engine Dealer for information on the Chrysler line – 230 to 331 cubic inch displacement. If you prefer, write direct:
Dept. 55, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.

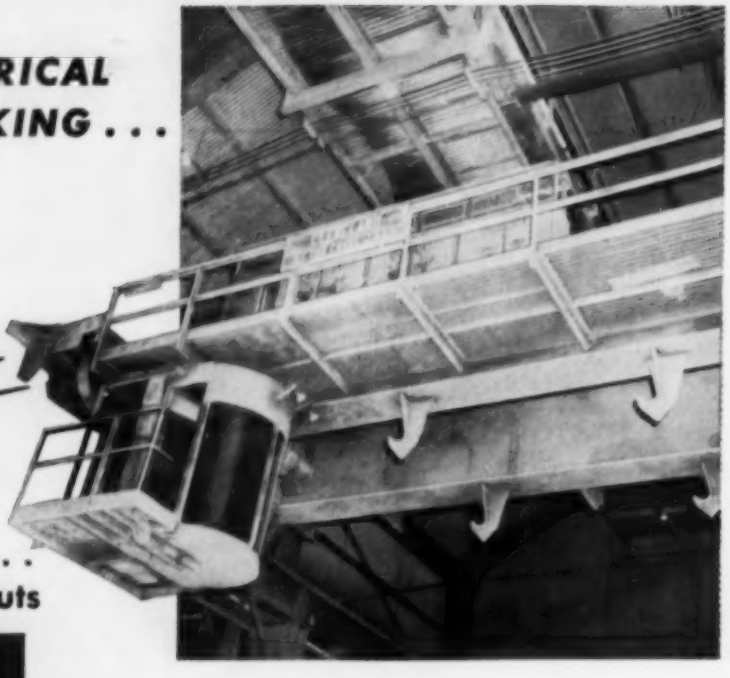
Chrysler Ind. 32 Engine — 265 cubic inch displacement

Chrysler
INDUSTRIAL ENGINES

Industrial Engine Division • Chrysler Corporation



ELECTRICAL BRAKING . . .



gives smoother, safer operation . . . lengthens brake life . . . prevents motor burnouts

Pressure on foot pedal in cab slows down the crane by dynamic braking. Further pressure on pedal applies foot-brake.

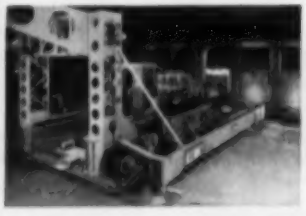
Many advantages have been gained . . . many economics have resulted from the use of electrical braking to slow down the cranes in this plant. In six years of operation, no foot-brake lining required replacement . . . no motor burnouts occurred. These cranes, operating on a 1000-ft. long runway, are easy to stop from high speed . . . or any speed. Braking is quick, smooth, positive, and operators like this less fatiguing method of operation.

When presented with this problem of applying electrical braking to the bridge motions of these cranes, EC&M engineered a simple Controller of Bulletin 921-2942 design, which was easy to install and easy to operate.

EC&M Control Apparatus and Control Engineering are well-known for providing control *engineered* to the task. For crane-bridge drives, EC&M builds standard reversing-plugging controllers, control giving 2 steps of plugging, and emergency dynamic braking control for full protection should power fail.

Call in an EC&M engineer whenever crane control problems arise. He will be glad to discuss control suited to your application.

FAIL-SAFE control for stopping Chargers . . . Ore Bridge Trolleys



The compact 3-contactor Panel, at right above, brings charging machines quickly to rest whenever power fails . . . main power outage, overload relay tripping or failure of collector-shoe circuit. This control has the same advantages for the bridge motions of overhead cranes, larry cars and similar machines.

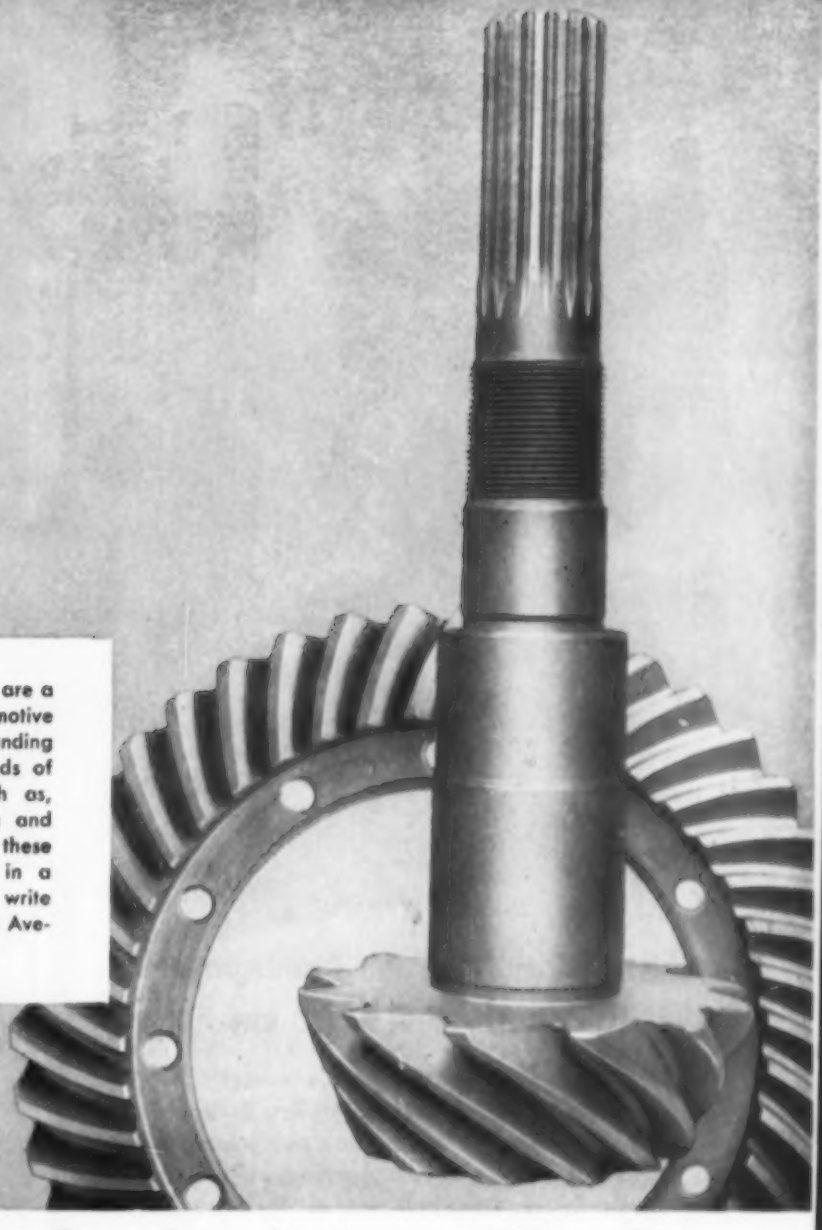
Of Fail-Safe design, this Control instantly changes the driving motors into self-excited generators, whenever power fails, to produce a cushioned, non-skid, quick stop. Panel-height is low for easy mounting on existing machines . . . ready application on new cranes. For complete facts, ask for Bulletin 921-2926.

THE ELECTRIC CONTROLLER & MFG. CO.

DIVISION OF SQUARE D COMPANY

4498 Lee Road • Cleveland 28, Ohio

"IT'S BETTER IF IT CONTAINS MOLY"



Moly carburizing steels with 0.5% Mo are a natural for components like this automotive ring-gear and pinion. They have outstanding properties that suit them to the demands of gearing and similar applications, such as, superior case hardness, low distortion and good machinability. Many features of these new carburizing steels are discussed in a recent technical article. For a reprint, write Climax Molybdenum Company, 500 Fifth Avenue, New York 36, N. Y., Dept. 3.

Molybdenum Carburizing Steels

MOLYBDENUM OFFERS THE ECONOMICAL KEY TO PERFORMANCE

Over the years, molybdenum carburizing steels have proved their merits in scores of applications and at every level of production.

Design engineers know moly steels for their uniform hardenability, toughness and wear resistance.

Production men know that moly steels are easy to heat treat, easy to machine.

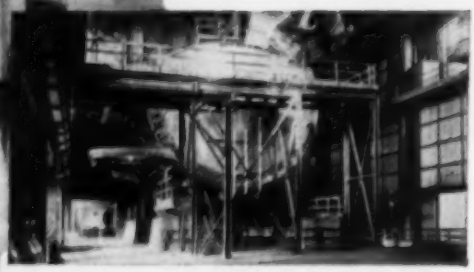
Management knows that moly steels mean economy in fabrication, high performance in a wide range of end products.

Standard molybdenum carburizing steels are widely available. Higher moly analyses may be ordered in heat lots from a number of leading suppliers.

CLIMAX MOLYBDENUM

A. P. GREEN
KX-99

In . . .
Complete Blast Furnace Linings
Hot Metal Mixers
Hot Metal Cars



Resist Carbon Monoxide Disintegration . . . Slag Action . . . Chemical Action and Abrasion

Fifteen leading steel companies have proved KX-99 Blast Furnace Brick in service. KX-99 were developed to meet the service requirements in the Steel Industry and are recommended for Complete Blast Furnace Linings, Hot Metal Mixers and Hot Metal Cars.

Check These Outstanding Properties of KX-99

1. Special high fired, Missouri super duty brick.
2. No sign of carbon monoxide disintegration in 1000 hour test at 900°F.
3. Apparent porosity in the range of 8 to 12 per cent with an average of 10 per cent.
4. Bulk density in the range of 2.30 to 2.40 grams per cubic centimeter.
5. Average modulus of rupture 1800 to 2500 pounds per square inch.

For detailed information on service and specific recommendations—contact your local A. P. Green Representative or write

KX-99 Blast Furnace Brick are manufactured to extremely close tolerances . . . uniform in dimensions . . . free from warpage.

A. P. Green REFRACTORY PRODUCTS

A. P. GREEN FIRE BRICK COMPANY
Mexico, Missouri, U. S. A.
PLANTS: Mexico, Mo., Woodbridge, N. J., Sulphur Springs, Texas
In Canada:
A. P. GREEN FIRE BRICK COMPANY, LTD.
Toronto 15, Ontario

A COMPLETE LINE OF FIRE-CLAY REFRACTORIES

When steel is 3 times stronger than cast iron . . .

Has two and one-half times the rigidity...

Yet costs a third as much per pound . . .

WHY

aren't more of your products designed for welded steel

Square Shear bed is more accurate *because it's more rigid. By using welded steel box-type construction, deflection under load is cut 60% over conventional cast iron design. Cost of construction is 28% lower than if made from castings. Photo courtesy Famco Machine Company, Kenosha, Wisconsin. View is from underside to show design details.*

HOW TO DESIGN HIGHER ACCURACY

. . . in precision machinery

THE photo shows how key components for modern machine tools are made even more accurate while reducing costs of manufacture.

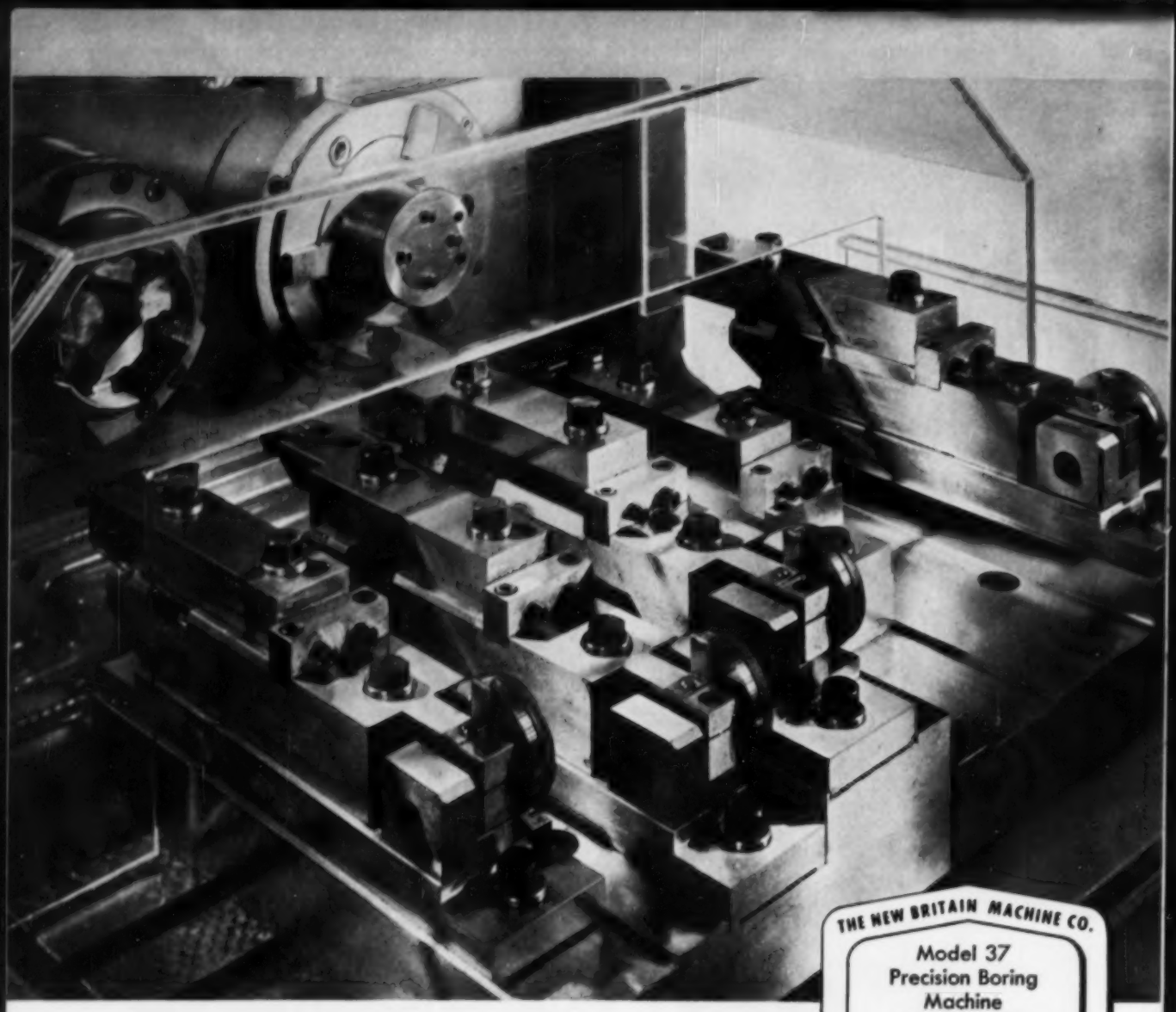
With steel designs less material is needed, because of steel's greater strength, high rigidity. Using welding, the steel materials can be placed where they do the most good.

Have Lincoln Electric show you how you can incorporate these advantages in your designs now. Write . . .

THE LINCOLN ELECTRIC COMPANY

Dept. 1617, Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment



THE NEW BRITAIN MACHINE CO.

Model 37
Precision Boring
Machine

NB

your most solid investment in precision boring machines

New Britain boring machines employ super-precision spindles and positive cam control of all tool paths. Both the spindles and the cam shaft are solidly mounted to the rugged frame to protect the original high accuracy for the life of the machine.

Available with either single or multiple spindles. Hopper feed, automatic gauging and tool resetting may be added. The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.

old methods can't compete

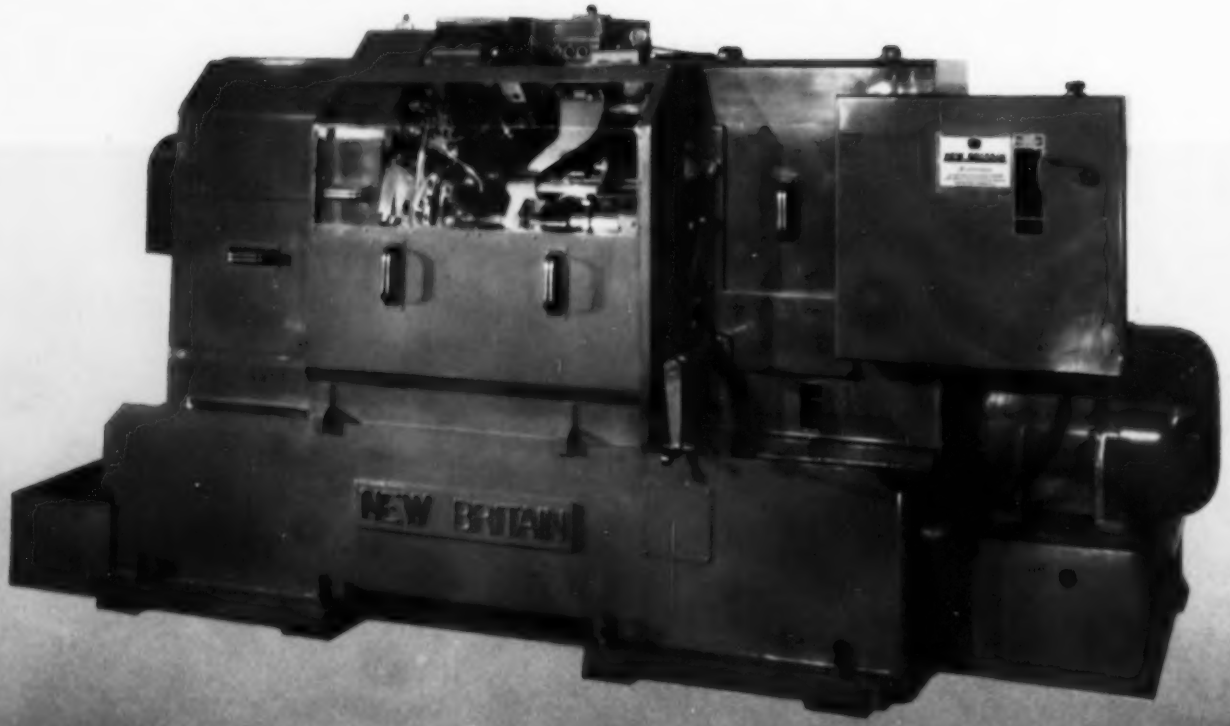
If you do *any* turning you should investigate the New Britain +GF+ line of copy turning lathes—whether your work calls for sustained production or short runs demanding quick setups. It turns tapers and complicated contours with the same setup used for simple O.D.'s. No need for expensive form tools. Let us demonstrate this completely different approach to turning in a color motion picture demonstration at your desk.

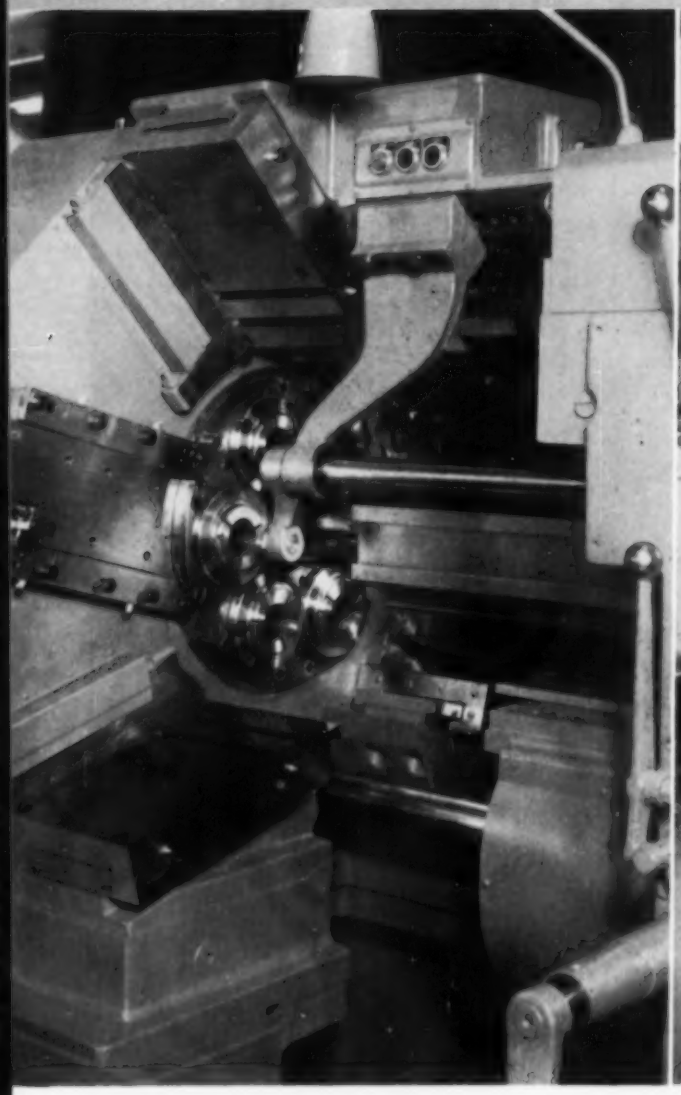
THE NEW BRITAIN MACHINE CO.
Model 11/70
New Britain +GF+
Copying Lathe
NB

a long new step forward
in bar machine productivity

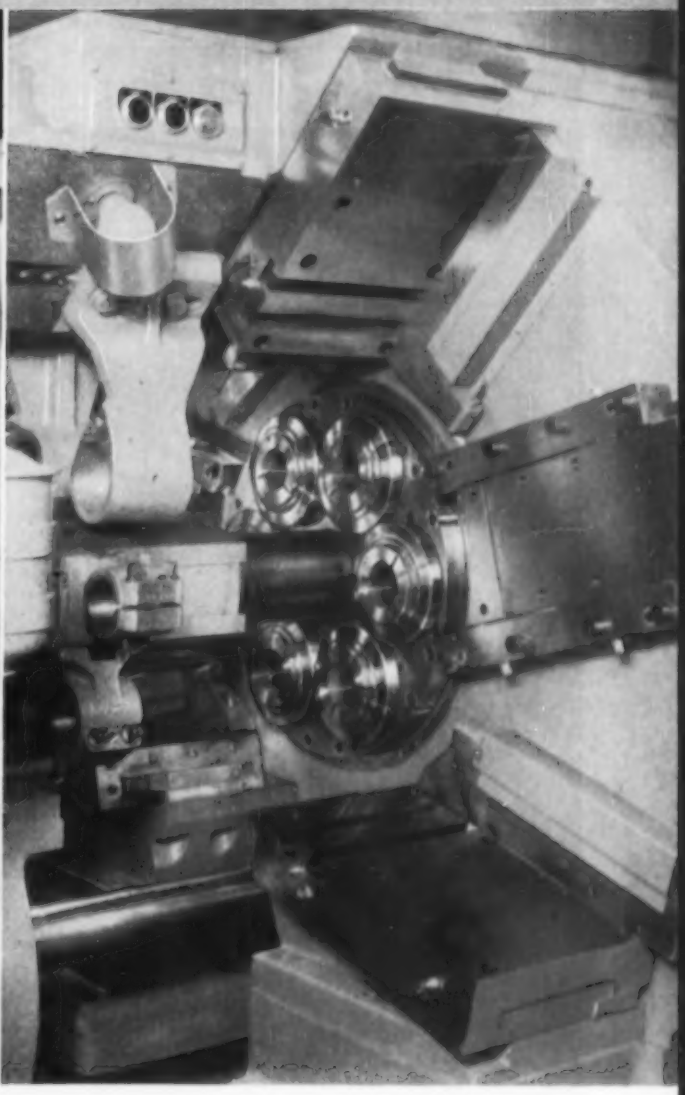
THE NEW BRITAIN MACHINE CO.
Model 62
Automatic Bar
Machine
NB

Here is a new New Britain bar machine with the ruggedness, power, speed and versatility to shed new light on your profit picture. Where you have bar work that now requires more than one machine, it may be practical to eliminate costly finishing operations by doing the whole job on a New Britain Model 62. Ask your New Britain representative or write The New Britain Machine Company, New Britain-Gridley Machine Division, New Britain, Connecticut.





Tooling area, front of Model 62



Tooling area, back of Model 62

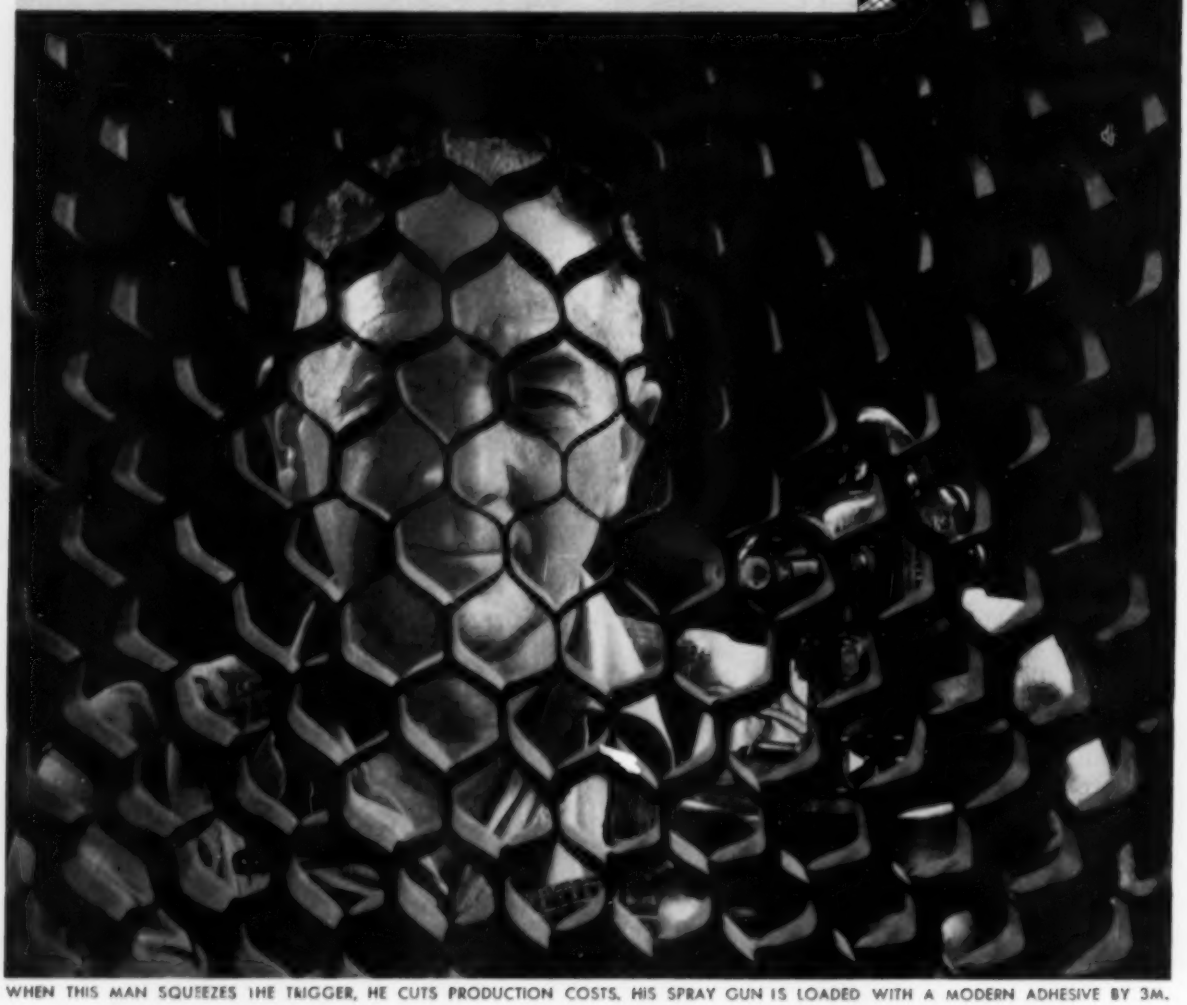
This new automatic combines the most important features for which New Britains are noted, with many basic improvements:

- Spindle carrier lifting to eliminate wear.
- Carrier locating and locking for uniform accuracy and rigidity.
- Spherical roller collet closing mechanism.
- Automatic stop.
- More efficient spindle spacing.
- An independent cross slide in every position.
- Maximum tool clearance.
- Improved accessibility to tooling area and cutting tools.

The NEW BRITAIN MACHINE COMPANY

New Britain-Gridley Machine Division, New Britain, Connecticut

See what adhesives are doing today!



WHEN THIS MAN SQUEEZES THE TRIGGER, HE CUTS PRODUCTION COSTS. HIS SPRAY GUN IS LOADED WITH A MODERN ADHESIVE BY 3M.

Triggerman for the comptroller

This worker shoots it out with his company's manufacturing costs every day. The 3M adhesive in his spray gun creates a structural sandwich that's inexpensive, featherweight and strong. *Naturally this adhesive is a comptroller's favorite.*

3M adhesives like EC-1357 and EC-1177 bond a honeycomb paper core between thin metal skins. They produce rigid, more durable units from such light materials because they're tougher, more flexible. Many industries benefit: building, furniture, aircraft, railroad equipment and others.

These 3M adhesives are specially designed for this sandwich construction, thoroughly tested. They apply fast and easily, like the hundreds of varied 3M adhesives for other uses.

SEE WHAT ADHESIVES CAN DO FOR YOU!

If you face a manufacturing problem, 3M research may hold the answer. Consult your 3M Field Engineer. For more information or literature write: 3M, Dept. 305, 417 Piquette, Detroit 2, Mich.

PRODUCT OF 3M RESEARCH

3M ADHESIVES

ADHESIVES AND COATINGS DIVISION, **MINNESOTA MINING AND MANUFACTURING COMPANY**

417 PIQUETTE AVE., DETROIT 2, MICH. • GENERAL SALES OFFICES: ST. PAUL 6, MINN. • EXPORT: 99 PARK AVE., N. Y. 16, N. Y. • CANADA: P. O. BOX 757, LONDON, ONT.

MAKERS OF "SCOTCH" BRAND PRESSURE-SENSITIVE TAPES • "SCOTCH" BRAND SOUND-RECORDING TAPE • "SCOTCHLITE" BRAND REFLECTIVE SHEETINGS • "3M" ABRASIVE PAPER AND CLOTH • "3M" ADHESIVES AND COATINGS • "3M" ROOFING GRANULES • "3M" CHEMICALS

THE 1956 IRON & STEEL EXPOSITION

CLEVELAND PUBLIC AUDITORIUM • SEPT. 25-28

★ **TELL-ALL EXHIBITS**

More than 200 companies that supply materials, equipment and services to the Steel Producing Industry will reveal their latest advances in eye-catching, informative displays and demonstrations.

★ **IMPORTANT TECHNICAL SESSIONS**

Four full days of intensive technical sessions offer a liberal education in "What's New" in steel plant operation, methods, planning, maintenance and many other pertinent subjects.

No Admission Fee • No Registration Charge

Open to Men of the Iron and Steel and Allied Industries

IRON AND STEEL EXPOSITION

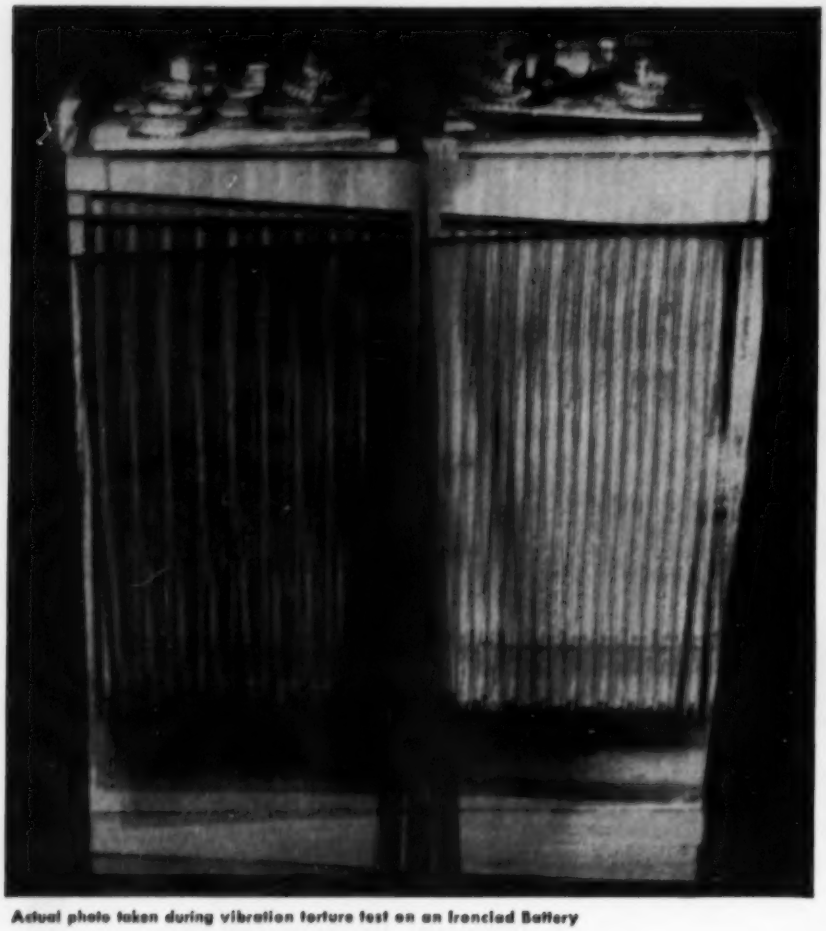
The Industry's Most Specific Show!

For additional information, write

Association of Iron & Steel Engineers, 1010 Empire Bldg., Pittsburgh 22, Pa.

EXIDE-IRONCLAD BATTERIES

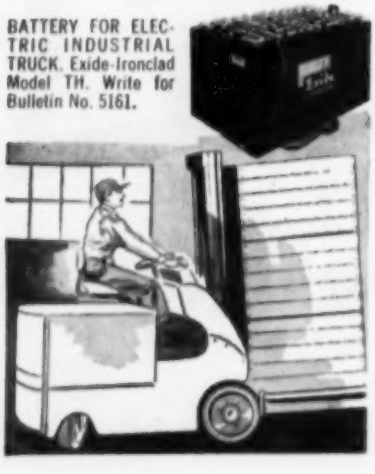
For electric industrial truck operation



Actual photo taken during vibration torture test on an Ironclad Battery

Section of Ironclad positive plate

Vibration can't loosen active material — can't shorten battery life



BATTERY FOR ELECTRIC INDUSTRIAL TRUCK. Exide-Ironclad Model TH. Write for Bulletin No. 5161.

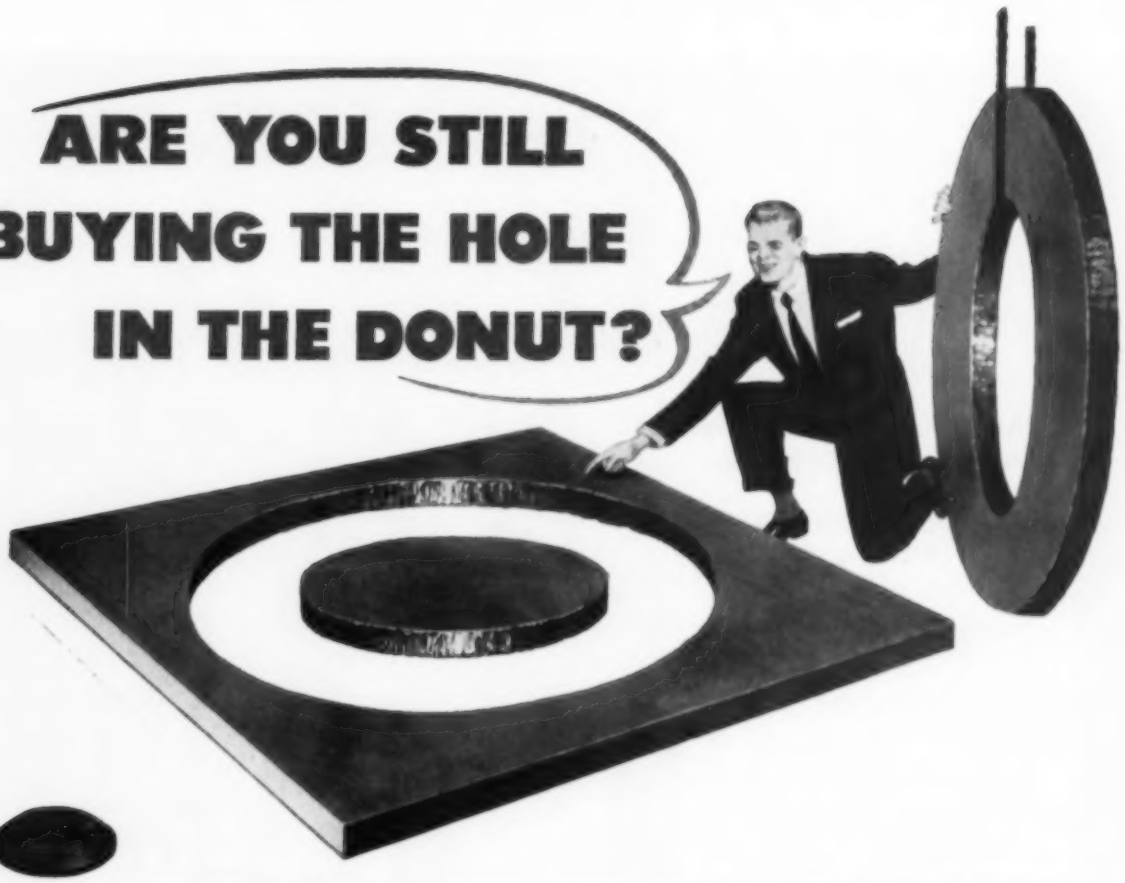
When a heavy duty storage battery gets the "shake treatment," battery life is literally at the mercy of the bond between the positive grid and the active material. Heavy shedding means short life.

But look what happens in an Exide-Ironclad Battery. Active material is held firmly captive inside the plastic power tubes. Hair-thin slits let electrolyte in, but keep active material from falling out. In prolonged vibration tests, this unique design has proved to be a valuable battery life stretcher. These findings are confirmed in the long, dependable service of Exide-Ironclad Batteries in typical high-vibration applications.

This superior performance is only one of the many extra advantages in Exide-Ironclad Batteries — advantages that have earned them an unmatched reputation for long life and high capacity. When you order heavy duty batteries, or the equipment that requires them, be sure to specify Exide-Ironclad. Write for detailed bulletin. Exide Industrial Division, The Electric Storage Battery Company, Philadelphia 2, Pa.

Exide®

ARE YOU STILL BUYING THE HOLE IN THE DONUT?



CLAYMONT FLAME CUT STEEL PLATE SHAPES

Paying for metal you can't use is a lot like buying the hole in a donut—it's just not good business!

That's where Claymont comes in. With Claymont Sheared or Flame Cut Steel Plate Shapes, pre-cut to your exact specifications...

. . . you save:

1. All freight charges on metal you can't use.
2. All handling charges on scrap—because there's no scrap to handle.
3. Storage space—since you don't have to store useless metal.
4. All charges involved in maintaining a plate inventory.

. . . you gain:

1. Better use of your capital investment by reducing needs for materials, patterns and manpower required to cut shapes in your own shop.
2. A constant steel supply from Claymont's widespread producing facilities.
3. The ability to meet all parts production schedules on time.
4. The opportunity to use your investment in shop equipment to better advantage.

A Claymont representative will be happy to give you full details on these and other advantages—without obligation, of course! Just contact our nearest district sales office or write to Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware.

3414

CF&I **Claymont Steel Products**

Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

Abilene (Tex.) • Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston • Lincoln • Los Angeles
New Orleans • New York • Oakland • Odessa • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Tulsa • Wichita
CANADIAN OFFICES AT: Toronto • Vancouver

OTHER CLAYMONT PRODUCTS

Stainless-Clad Plates • Manhole Fittings and Covers • Large Diameter Welded Steel Pipe • Carbon and Alloy Steel Plates • Flanged and Dished Heads • CF&I Lectro-Clad Nickel Plated Steel

The Motor you asked for!

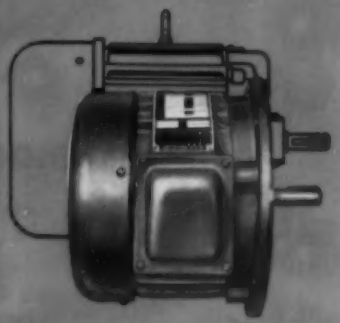
TAKES less space . . . because it's the new FLAT-Type Motor

GIVES more service . . . because it's a DIEHL

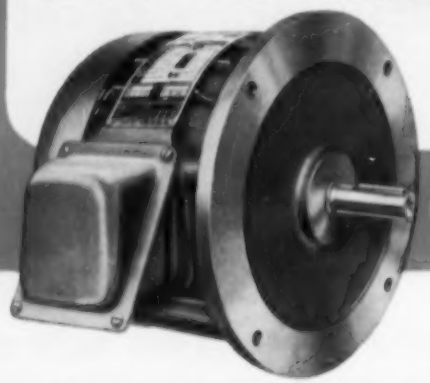
Non-Ventilated

FOR SIZE AND WEIGHT, COMPARE THE NEW FLAT-TYPE WITH STANDARD MOTORS

FRAME SIZE		OVERALL LENGTH (Inches)			APPROXIMATE NET WEIGHT (Lbs.)		
Standard	Flat-Type	Standard	Flat-Type	Saving	Standard	Flat-Type	Saving
DIF 182	DIF 180	14 1/16	10 3/4	3 1/16	82	59	23
DIF 213	DIF 220	17 3/16	11 11/16	5 3/8	128	83	45
DIF 284U	DIF 280	26	13 13/16	12 3/16	272	135	137



New Flat-Type superimposed on standard motor



Fan Cooled

The unique and perfect answer in *integral motors*—designed especially for the machine tool and equipment industries. Packs full horsepower in less space . . . actually up to 48% shorter than standard motors without sacrifice in performance. Many pounds lighter, too, than conventional motors (over 50% in some cases), meaning vastly reduced over-hung weight. Standard radial construction, easy to disassemble and reassemble . . . no precision alignments or complicated air-gap adjustments to contend with. Totally-enclosed . . . no dirt, dust or moisture can get in. Available (non-ventilated) in ratings to 3 H.P., and (fan-cooled) in ratings to 20 H.P.

Perhaps the Diehl Flat-Type Motor is just what you need to solve your application problems. Give us the details and we'll be glad to submit recommendations. Ask for your copy of Bulletin S-3461.

Diehl

DIEHL MANUFACTURING COMPANY

Electrical Division of THE SINGER MANUFACTURING COMPANY

Finderne Plant, SOMERVILLE, NEW JERSEY

ATLANTA · BALTIMORE · CHARLOTTE, N. C. · CHICAGO · CINCINNATI · DETROIT · MILWAUKEE · NEEDHAM, MASS. · NEW YORK · PHILADELPHIA · PITTSBURGH

The same trucks that do the stacking also transport appliances from end of assembly line to storage, and from storage to loading docks. Two-way radio dispatch system expedites movement.

13 BAKER TRUCKS give General Electric Appliance Park "floor-to-ceiling" utilization of warehouse space!

Every cubic foot of storage space in this mammoth appliance warehouse is utilized by compact stacking. Baker Trucks, equipped with a special lift attachment that handles cartons or crates without forks, help do the job.

General Electric has a fleet of 13 such trucks at this installation and is adding 5 more. This new concept in appliance handling completely eliminates the use of pallets—which would have meant an additional investment 8 or 9 times the cost of the trucks. The absence of forks and pallets makes possible stacking one tier higher and reduces aisle space required, thus increasing storage capacity more than 25%.

The trucks have a total lift of 242 inches. Appliances are handled 4 per load for the bottom 2 tiers, and 2 per load for upper tiers. Gravity sliding back-rest aligns loads perfectly with tiers below and protects them from impact damage. Side-shifter butts loads snugly against adjacent stack for lateral alignment.

A Baker handling engineer can help you devise similar cost-saving methods in your plant or warehouse. Call your nearest Baker representative or write us direct.

Baker handling equipment

THE BAKER-RAULANG COMPANY

1259 WEST 80th STREET • CLEVELAND 2, OHIO

A subsidiary of Otis Elevator Company

68 6

ÆSOP'S FABLES No. 2

The hungry Wolf saw Mrs. Goat feeding at the top of a steep precipice, where he had no chance of reaching her. Again and again he implored her to come down where the grass was much sweeter and more abundant. Finally, she replied: "Are you certain, friend Wolf, that it is *my* supper you are so concerned with, and not your own?"

Moral:

The friend with an ulterior motive can be dangerous.

. . . we *confess* an "ulterior motive" but, a beneficial one . . . the more good companies such as yours that become aware of the "outage time" and money *saved* with superior ADAMANT Fire Brick Cement . . . or any of the popular ADAPRODUCTS Line of Refractories . . . the greater opportunity we have to be of service and fill your *every* Refractory requirement.

Our new Bonding Mortars bulletin #3 will gladly be sent upon request.

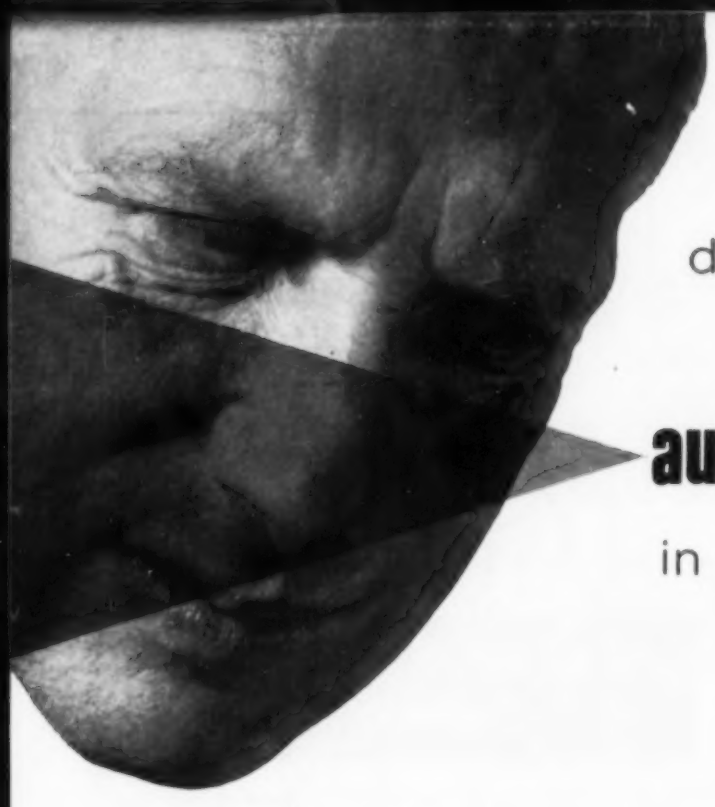
Botfield

ESTABLISHED 1907

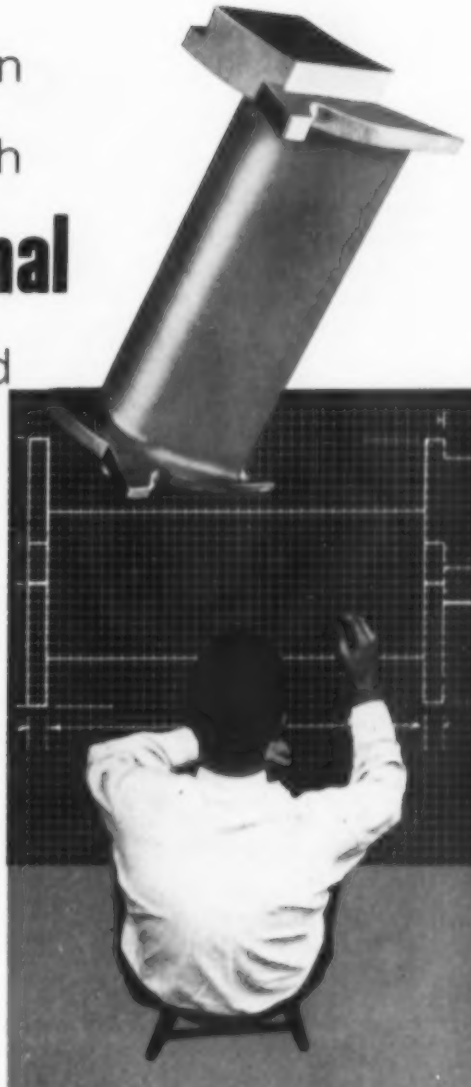
REFRACTORIES

ADAMANT and other ADA products

swanson and clymer sts.
philadelphia 47, penna.



design
with
austenal
in mind



microcast *quality control starts with the blueprint...*

Quality Control at Austenal begins in the planning stage . . . long before any actual manufacture of parts is undertaken.

In order to achieve the finest finished product, design engineers consult first with Austenal engineers and profit from their experience and advice. Thus, you can *design directly for Microcast* and take advantage of the special features it makes possible.

During manufacture, many separate and vital Quality Control steps check production – from the initial alloy melt to critical examination for dimensional accuracy and internal structural soundness.

Quality Control works hand in hand with advanced research to improve and maintain Microcast techniques and applications. For this purpose, Austenal maintains the industry's finest, most advanced research facilities.

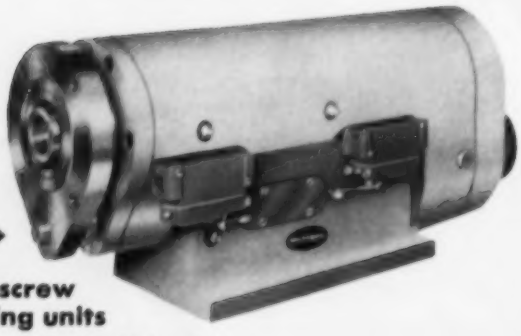
Think *Austenal* when you design. You'll be sure that high quality and maximum performance will be *built right from the beginning* into any product you require.

austenal
LABORATORIES, INC.
microcast division
224 EAST 39th STREET, NEW YORK 16, N. Y.
7001 SOUTH CHICAGO AVE., CHICAGO 37, ILL.

...It's **NEW** *from Austenal*

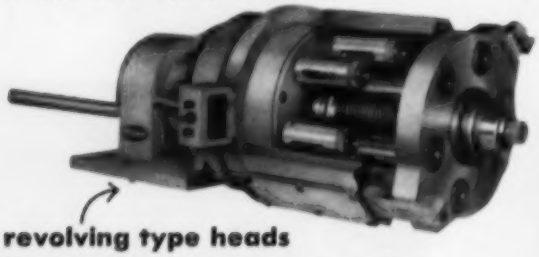
After-burner nozzle segments, impractical and prohibitively expensive to manufacture by any other means, are produced by Austenal to exacting aircraft standards.

Write today for Austenal's latest booklet, "Design with Microcast in Mind."



lead screw tapping units

Single-spindle or multiple-spindle, and, plain or flange quill mounting.



revolving type heads

Mount vertical on any center-column machine with rotating chuck.

hydraulic index tables

Simple design—maximum safety—completely hydraulically operated.

hydraulic drilling and boring units

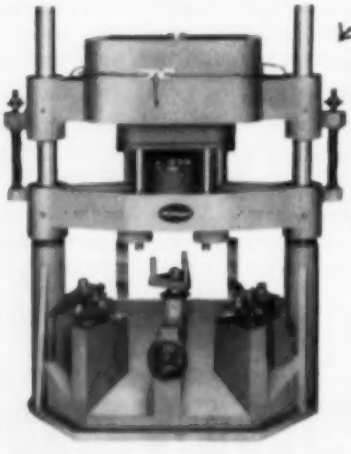
All units have hardened ways, with cylinder mounted in bottom of unit.

use Michigan Components

... For Faster, More Economical Production

Here are a few typical examples of Heads, Bushing Plates, Fixtures, Automatic Index Tables, Hydraulic Drilling and Boring Units, and, Lead Screw Tapping Units used by Machine Tool Builders and Manufacturers, who insist upon the finest, when building or re-tooling.

We also build Revolving Heads for Chucking Machines.



multiple drill heads

Adapted for any type drill press and feed units. Shown with bushing plate and fixture.

We solicit your inquiries on any of your Multiple Drilling Problems.

Michigan DRILL HEAD CO. Detroit 34, Michigan

engineers and manufacturers of production machines and drilling equipment

NOW...

an EXTERNALLY WRENCHED SCREW

that can be used in *standard*
counterbored holes with *standard* wrenches

THE FERRY CAP

countr-bor®

SCREW

For counterbored or other socket head screw applications, external wrenching instead of internal wrenching means:

- More gripping surface
- More torque
- More savings

TRY THEM—

Save knuckles—save time—save costs.

Solve simply the tough assembly problems and improve appearance where socket screws are required.

Send for samples.

You'll receive prices, complete information and samples promptly upon request.

Any type socket wrench handle with standard 12-pt. socket is used for counterbored applications.

Ferry Cap Countr-Bor Screws
PATENT APPLIED FOR
MANUFACTURED SOLELY BY

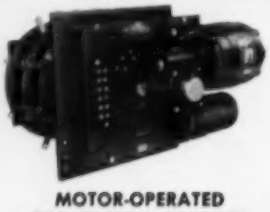
THE FERRY CAP & SET SCREW COMPANY
2159 SCRANTON ROAD • CLEVELAND 13, OHIO

In electroplating, anodizing, and allied processes...

Rectifier Performance Depends on Controls

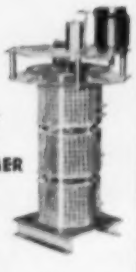
MANUAL TAP SWITCH CONTROL

For both self-contained and remote controlled units. Used in conjunction with a tapped auto-transformer, it provides 22 positions of voltage adjustment from zero to rated voltage.



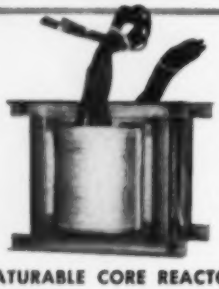
MOTOR-OPERATED TAP SWITCH CONTROL

For pushbutton control of output from remote location. Used in conjunction with tapped auto-transformer and it also gives 22 positions of voltage adjustment.



CONTINUOUSLY VARIABLE AUTO-TRANSFORMER

Either manual for small rectifiers, or oil-immersed, motor-driven for larger ratings. Gives full stepless control from zero to rated voltage. Highest efficiency.



SATURABLE CORE REACTOR

Wholly electrical — no moving parts. Gives smooth control from 10% to 100% of rated voltage, provided 10% minimum current load is drawn.

The selection of the proper controls with either selenium or germanium rectifiers can be the key to improving your plating and anodizing results. For every installation there is a control which will best fit the application. Let H-VW-M make an engineering survey and recommend the most suitable control to give you not only the best results, but also the maximum in efficiency, flexibility, and economy.

APPLICATION SUGGESTIONS

Use	Recommended Control
Batch Tank Plating	Manual tap switch.
Batch Tank Plating with wide load variations and high production	Motor operated variable auto-transformer or motor operated tap switch.
Barrel Plating	Manual tap switch. No control rectifier.
Cleaning & Pickling	Manual tap switch. No control rectifier.
Conveyor—many stations	Manual tap switch (remote control). Motor operated tap switch. Saturable core reactor. Motor operated continuously variable auto-transformer.
Conveyor—few stations	Automatic voltage stabilization with variable auto-transformer. Automatic voltage stabilization with saturable core reactor.
Chrome strike in combination with Plate	Automatic programming with variable auto-transformer or special series hook-up.
Sulphuric Anodizing	Manual tap switch. Motor operated tap switch. Saturable core reactor.
Color Anodizing	Automatic constant current with variable auto-transformer. Automatic constant current with magnetic amplifier and saturable core reactor.
Chromic Anodizing	Automatic programming with variable auto-transformer. Combination automatic constant current and automatic voltage stabilization with variable auto-transformer or saturable core reactor.
Electrolytic Metal Refining	Automatic current control with saturable core reactor.

Need Automatic Voltage Stabilization?

For close DC voltage regulation, automatic voltage stabilization will maintain voltage at pre-set level. Use either sensing panel with motor-driven, oil-immersed continuously variable auto-transformer, or special magnetic-amplifier with saturable core reactor. H-VW-M controls can also provide automatic constant current.

Need Automatic Programming?

Motor-operated continuously-variable auto-transformers, plus timers and controls, will set voltage and operate for pre-set time; change to another voltage at pre-set rate; operate at new voltage for given time, then shut the rectifier off.

PLATEMANSHIP

Your H-VW-M combination — of the most modern testing and development laboratory — of over 80 years experience in every phase of plating and polishing — of a complete equipment, process and supply line for every need.

SEND TODAY for free Bulletin ER-108 describing H-VW-M SELENIUM and GERMANIUM Rectifiers and H-VW-M's full line of controls.

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, N. J.
Plants: **Matawan, N. J. • Grand Rapids, Mich.**
SALES OFFICES: Anderson (Ind.) • Baltimore • Beloit (Wisc.) • Boston Bridgeport • Chicago • Cleveland • Dayton • Detroit • Grand Rapids • Los Angeles • Louisville • Matawan • Milwaukee New York • Philadelphia • Pittsburgh • Plainfield • Rochester St. Louis • San Francisco • Springfield (Mass.) • Utica Wallingford (Conn.)

H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

steel fabrication . . . by the forces of AVONDALE

If there is one industrial service for which Avondale is world-famous, it is steel fabrication. Avondale knows how to handle steel, skillfully and with great speed. Avondale has pioneered in the use of steel to serve the needs of many industries—in offshore oil operations, marine, chemical and construction fields. Avondale's products of steel are of outstanding quality, carefully engineered and masterfully fabricated. These products include steel ships, towboats, tugboats, barges, offshore drilling rigs, platforms, pipe jackets, porcelain enamel on steel service stations . . . and many more.

SHIP BUILDING • SHIP REPAIRING • FOUNDERS • PROPELLERS • STRUCTURAL STEEL

AVONDALE MARINE WAYS, INC. CABLE ADDRESS "AVONWAYS"

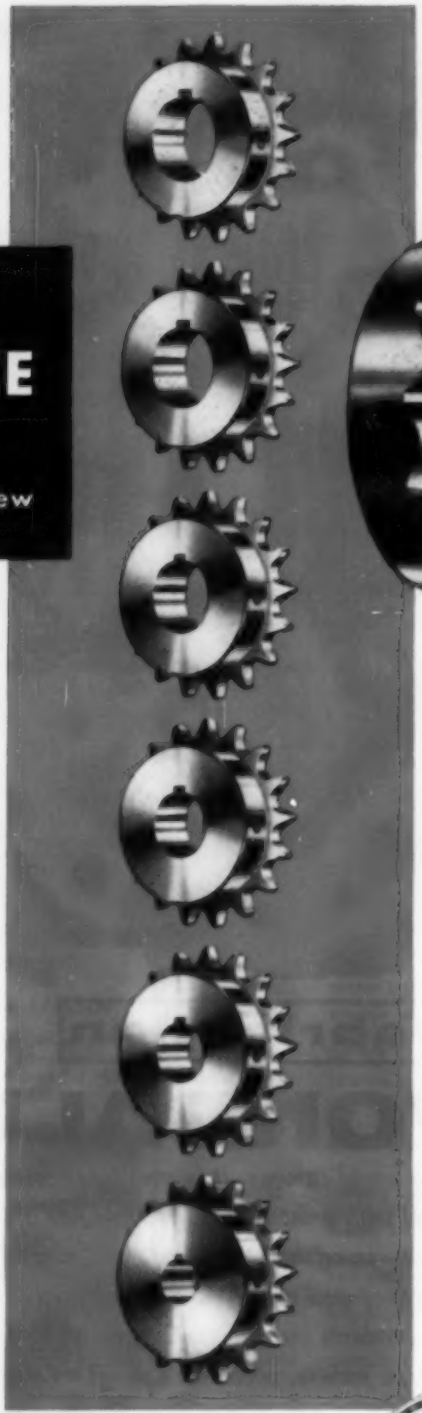
P.O. BOX 1030 • PHONE UNiversity 6-4561 • NEW ORLEANS 8, U.S.A.

NOW! — another cost-saving service from your nearby **BOSTON Gear DISTRIBUTOR**

STANDARD STOCK

BORED-TO-SIZE SPROCKETS

complete with Keyway and Setscrew



76 TOOTH SIZES
321 STOCK BORES

"OFF-THE-SHELF" — AT FACTORY PRICES

FINISH BORED — READY TO INSTALL Single width steel sprockets ⅜" Pitch through 1" Pitch—in 76 commonly used Tooth Sizes —with a full selection of finished bore diameters for each sprocket—complete with keyway and setscrew.

ELIMINATE BORING EXPENSE You save expense of reboring, keyway cutting, drilling and tapping for setscrew—and avoid downtime in emergency replacements.

BOSTON GEAR QUALITY Sets the standard for precision and performance—assures longer service life for both sprockets and chain.

OFF-THE-SHELF DELIVERY More than 100 BOSTON Gear Distributors can supply BORED-TO-SIZE Sprockets from stock. Get complete information, on any question of sprocket selection or application, from factory-trained specialists . . . at the Distributor near you. Boston Gear Works, 73 Hayward St., Quincy 71, Mass.

The BOSTON Gear complete line provides any Sprockets you need including SHOLD-A-GRIP interchangeable tapered Sprockets and Bushings. For complete listings, see BOSTON Gear Catalog No. 56.

CALL YOUR BOSTON Gear DISTRIBUTOR

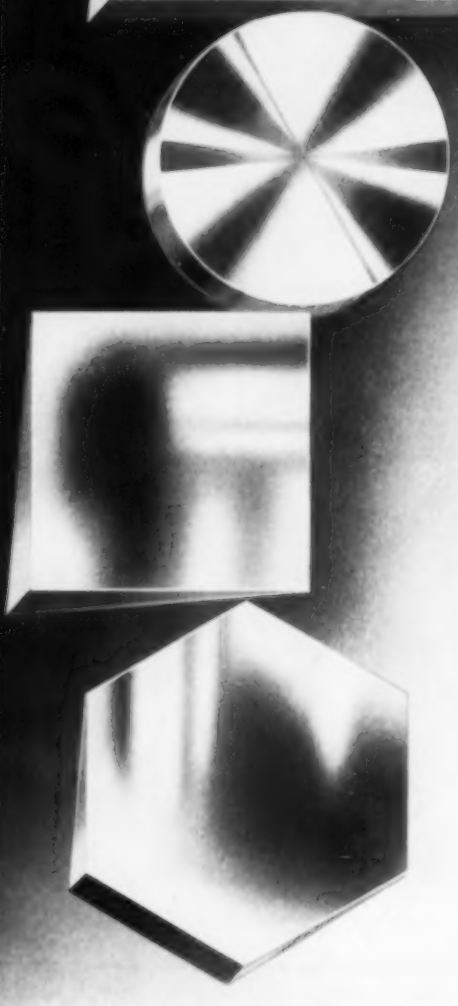
For nearest Distributor, look under "GEARS" in the Yellow Pages of your Telephone Book.

56BG-S-23

LUSTERIZED*

TRADE-MARK REGD.

FINISH



This new brighter Cold Drawn Finish now available from Bliss & Laughlin in all:

ROUNDS • SQUARES
FLATS • HEXAGONS

IN STANDARD GRADES AND SIZES

CARBON AND ALLOY BARS
LEDLOY—LEADED STEELS

PRODUCED
only by Bliss & Laughlin at all Four Plants

DISTRIBUTED
through warehouse stocks —coast to coast

On Your Next Order, Specify
LUSTERIZED FINISH
Cold Drawn Bar Steels

*PAT. APPLIED FOR

BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

SALES OFFICES
IN ALL PRINCIPAL CITIES

FOUR PLANTS:—

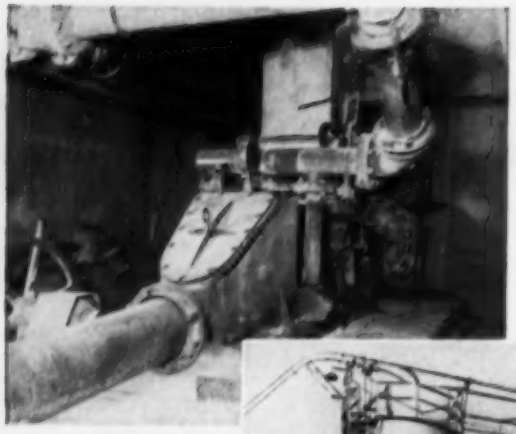
HARVEY, ILL.

DETROIT, MICH.

BUFFALO, N. Y.

MANSFIELD, MASS.

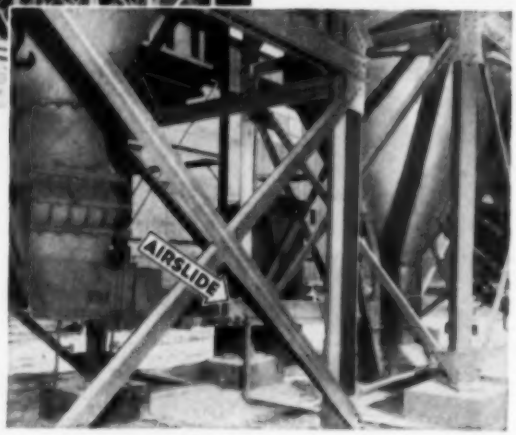
Fuller Air-Conveying System pays off for a steel foundry



Above: One of two Fuller-Kinyon Portable Pumps which convey either from cars to storage, or from storage to supply bins above mixers.

Storage bins, conveying pipe lines from car unloading station to bins, and from bins to mixers.

Below: F-H Airslide from bin for discharge to pump.



General Steel Castings Corporation, Granite City, Illinois has greatly improved its handling of incoming sand ingredients by installing the Fuller-Kinyon Conveying System in conjunction with F-H Airslides.

Corn flour, silica flour, and bentonite, received in hopper-bottom cars, discharge direct to a Fuller-Kinyon Portable Pump, which conveys through pipe lines to a number of storage bins. Two such pumps, located in a tunnel, are mounted on trucks running on a narrow gage track for easy spotting under the cars or bins. The system is quite flexible—one pump is used mainly for unloading cars and delivering to storage, the other for reclaiming from storage for delivery to supply bins above mixers. Both pumps, however, can be used for either purpose. It is also possible to unload from cars and reclaim from storage simultaneously. Where bins are located so they cannot discharge directly to a pump, F-H Airslides convey to the pump.

Previous to the Fuller installation, materials were received in bags, manually unloaded, stored and transported to the mixers. These operations have all been eliminated, as well as waste and dust from broken bags, together with release of bag-storage space for other uses. Also, there is an inherent saving when purchasing materials in bulk. All of this means clean, efficient materials handling, plus more dollars on the profit side of the ledger.

Fuller air-conveying systems are in operation in thousands of plants throughout industry, cutting costs and increasing profits, day in and day out. The next time you have a materials-handling problem, why not get in touch with Fuller . . . chances are you will also profit as so many others have.

Fuller
. . . . pioneers in harnessing AIR

FULLER COMPANY
GENERAL AMERICAN

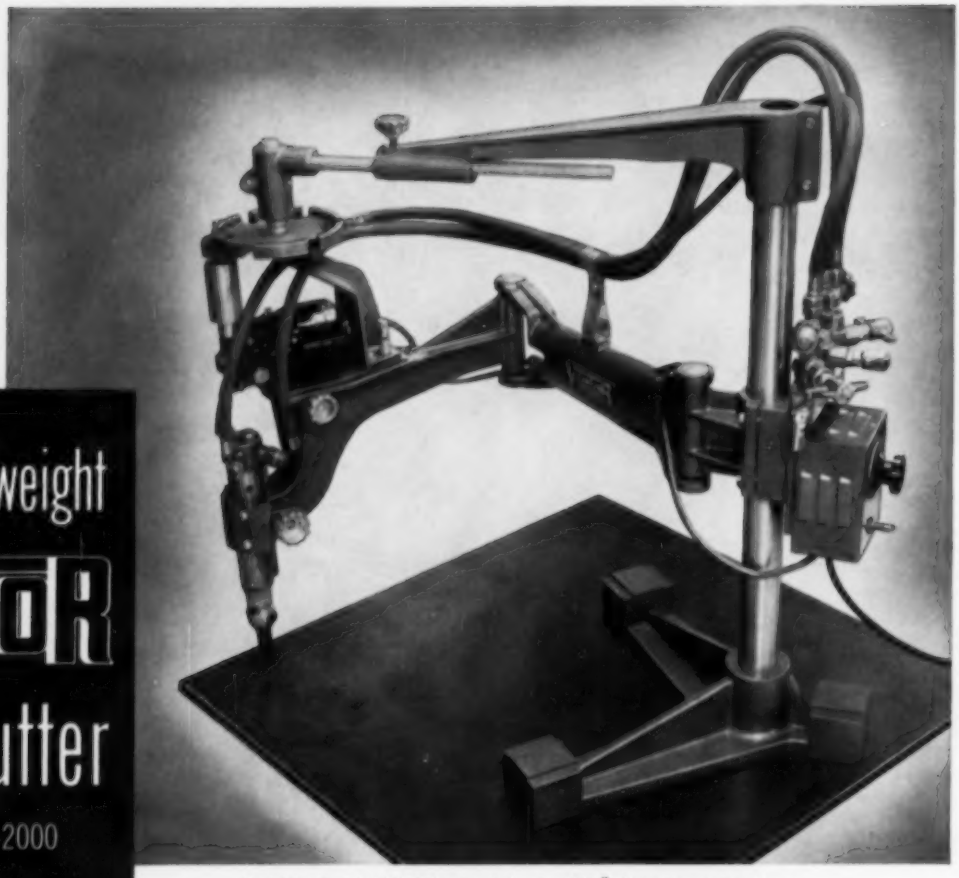
G-109
1479

FULLER COMPANY
160 Bridge St., Catasauqua, Pa.
GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
Chicago • San Francisco • Los Angeles • Seattle • Birmingham

THERE'S A
COMPLETE LINE OF ROEBLING
Galvanized
ROEBLING is a specialist in galvanizing with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283" to .035"... Roegal (drawn galvanized) from .187" to .005".
And Roebling galvanized wire can be packaged in the way most convenient and economical for you... in coil diameters of 60", 30", 22", 16" and 8"...on reels, spools or handy spoolless cores.
You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! John A. Roebling's Sons Corporation, Trenton 2, New Jersey.
ROEBLING
Subsidiary of The Colorado Fuel and Iron Corporation
ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. & 5 PITTSBURGH ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREGONIA AVE. • CLEVELAND, 13235 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • ROCHESTER, 1 FLINT ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • ST. LOUIS, 3001 DELMAR BLVD. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, 19 RECTOR ST., NEW YORK

New, lightweight VICTOR Duplicutter

MODEL DC-2000



Portable Model DC-2000 cuts circles to 19½" diameter, rectangles to 12" x 35", and metals to 8" thick. Torch accommodates all Victor 1-101 and 1-100 cutting tips, through size 5.

Flame cuts parts accurately, saves handling and set-up time, increases labor efficiency.

This portable VICTOR DUPLICUTTER weighs only 36 pounds. Operator easily carries it to any work location in plant, yard or warehouse . . . thus saving you time and cost of moving materials. Set-up takes minutes only. You lose no time leveling DUPLICUTTER—its magnetized feet use stock being cut as working base. And it's so simple one man easily handles production from 2 or 3 DUPLICUTTERS.

Precise controls and powerful, permanent magnet in template follower enable you to duplicate parts to production tolerances of plus or minus 1/64". Easy, quick interchange of templates makes DUPLICUTTER practical for both long production runs or duplication of single part.

Why not see for yourself how easily the VICTOR DUPLICUTTER handles, how fast and accurately it cuts? Call your VICTOR dealer NOW and ask him for a demonstration on your job . . . or write us for descriptive Bulletin 353.

For maximum efficiency and safety, use genuine Victor tips and parts

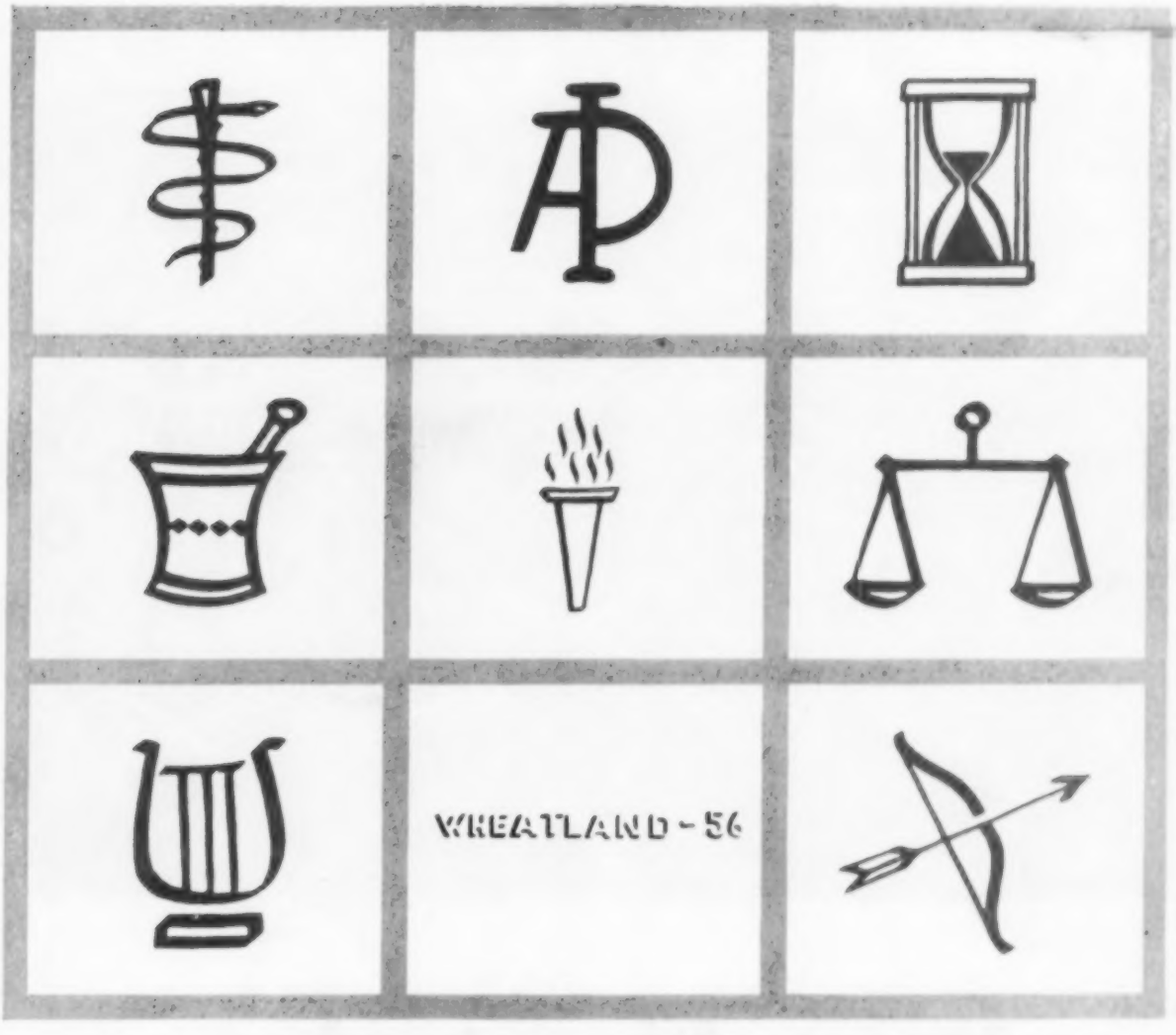
VICTOR for welding

VICTOR EQUIPMENT COMPANY

Mfrs. of welding & cutting equipment; hardfacing rods, blasting nozzles; cobalt & tungsten castings; straightline and shape cutting machines.

30

844 Folsom St., San Francisco 7 • 3821 Santa Fe Avenue, Los Angeles 58



can you identify these marks?

Going back to ancient times craftsmen identified themselves by symbols of their particular art.

In many cases, as with silversmiths and other artisans, this mark was carried on the finished product as a symbol of master craftsmen.

Today each length of Wheatland steel pipe carries its own identification—welded into each length of "The Pipe with the Yearmark" are the words—*WHEATLAND '56.*

This is our mark of fine, dependable, uniform workmanship. Made by men who know pipe, who understand your piping problems.

Next order specify Wheatland, the pipe with the Yearmark.

WHEATLAND TUBE COMPANY

BANKERS SECURITIES BUILDING, PHILADELPHIA 7, PA.

MILLS • WHEATLAND, PA. • DELAIR, N. J.

Man without a hoe

This cornfield once looked hopelessly over-grown with weeds.

Now the weeds are under control. *Yet not a single hoe ever touched the soil.*

Give the credit to 2,4-D, an amazing chemical discovery. It destroys only broad-leaved weeds. And gives food plants like corn, wheat, rice, oats and barley a new lease on life!

Unlike older weed killers, 2,4-D is a hormone-type herbicide. It disrupts the normal growth of broad-leaved weeds. In three or four weeks, they're *dead.*

What's 2,4-D? Actually, 2,4-dichlorophenoxyacetic acid. And there were tough problems to overcome at nearly every stage of its development.

Corrosion, for example, was a constant threat to the life of equipment — and to the purity of the final product. So Nickel and Monel* nickel-copper alloy are specified for pipes and fittings, steam coils, reactors, centrifuges, dryers, tanks and other equipment used in making and handling 2,4-D.

Nickel and Monel nickel-copper alloy protect product purity. And they resist corrosion as few metals do!

Tuck that information away where it will be handy. You may be able to use it in solving a problem of your own.

Better still, do this — now. Send for "Standard Alloys for Special Problems." This booklet summarizes the properties, applications and available forms of all the Inco Nickel Alloys. Write us for a copy. Use it to help you select the most suitable metal for *your* job. The International Nickel Company, Inc., 67 Wall Street, New York 5, N. Y.

INCO TRADE MARK

INTERNATIONAL NICKEL

Nickel Alloys Perform Better, Longer

*Registered Trademark of The International Nickel Company, Inc.

Metalworking Outlook

Steel Talks Start

The United Steelworkers starts negotiating today (May 28) with U.S. Steel Corp., Bethlehem Steel Co. and Republic Steel Corp. Parleys start tomorrow and succeeding days with other steel companies. The preliminaries will last a week to ten days. Brass-tack bargaining won't begin until about the middle of June. The 650,000 members of the union employed by steel producing companies comprise more than half the organization's membership. The remaining 600,000 or so work in fabricating and other metalworking plants. Their contracts expire on varying dates in the second half.

Questions on SUB

Auto makers are in the peculiar position of having to sell SUB to their workers. Says one spokesman: "We're drawing up a layman's guide to SUB for all laid-off men. We hope the unions will do some explaining, too." Major questions that need answers: Why do company benefits vary from state to state? (Because different states grant different amounts in unemployment compensation.) Why is the duration of company benefits usually so short? (Because most workers laid off have short tenure, and, hence, low layoff credits.) What will be done in states like Ohio which have refused to allow the public plan to be tied in with the private ones? (Hope for a reversal in position; if none comes, renegotiate with the union).

Seventh Paid Holiday

The most common fringe demand from unions in 1956 is the seventh paid holiday. Most labor people want it spotted as a half day before Christmas and New Year's Day. The second most popular position is the Friday after Thanksgiving. Third in popularity is Good Friday.

Leasing Dampener

Many inquiries received by machinery manufacturers about equipment lease programs result in installment sales rather than leases. So says W. J. Rekstis Jr., assistant vice president of C.I.T. Corp., industrial financing firm. Installment buying plans, faster depreciation schedules allowed since 1954 and the suspicious attitude by federal tax authorities toward many agreements have dampened leasing's popularity.

Debate on Scrap

Any move to further restrict iron and steel scrap exports could seriously depress the market and drive many small dealers virtually out of business. "This is not the time to talk restrictions," says Edwin C. Barringer, executive vice president of the Institute of Scrap Iron & Steel. His comments come as a result of pleas by National Steel Corp.'s E. T. Weir and Jones & Laughlin Steel Corp.'s Ben Moreell for more government controls on scrap shipments overseas. The industry generated 38 million long

Material Handling Section—p. 165 Market Outlook—p. 173

tons of purchased scrap for domestic and export use last year, 50 per cent over the peak year in World War II. So far this year, generation has been running at an annual rate of more than 40 million tons. "There is no scrap shortage," says Mr. Barringer. "At a time when mill operations are 96 per cent of capacity, many mills are buying only token amounts."

Europe Boosting Steel Prices

Look for West German steel prices to go up in a range of 4 to 8 per cent about midyear. French steelmen want their quotations hiked an average of 4 per cent; the move will probably come about the same time as the German changes. British steel prices went up 5 per cent on May 7.

Stainless Goes Atomic

The steel industry may be producing 20,000 tons of stainless annually for atomic power plants and nuclear fission sometime after 1958. Dr. Robert P. Petersen, Republic Steel Corp.'s director of nuclear research, believes his company will be producing more than 500 tons of stainless annually for atomic purposes by the end of 1958.

Dave Austin To Retire?

At a meeting of the Cleveland Society for the Blind, the featured speaker was David F. Austin, executive vice president-commercial of U.S. Steel Corp. Galen Miller, vice president and treasurer, Towmotor Corp., introduced him. The newsworthy point about this conventional affair was the introduction in which Mr. Miller said Mr. Austin had remarked that he was going to retire before his normal retirement age and teach at the Harvard School of Business. Mr. Austin made no denial.

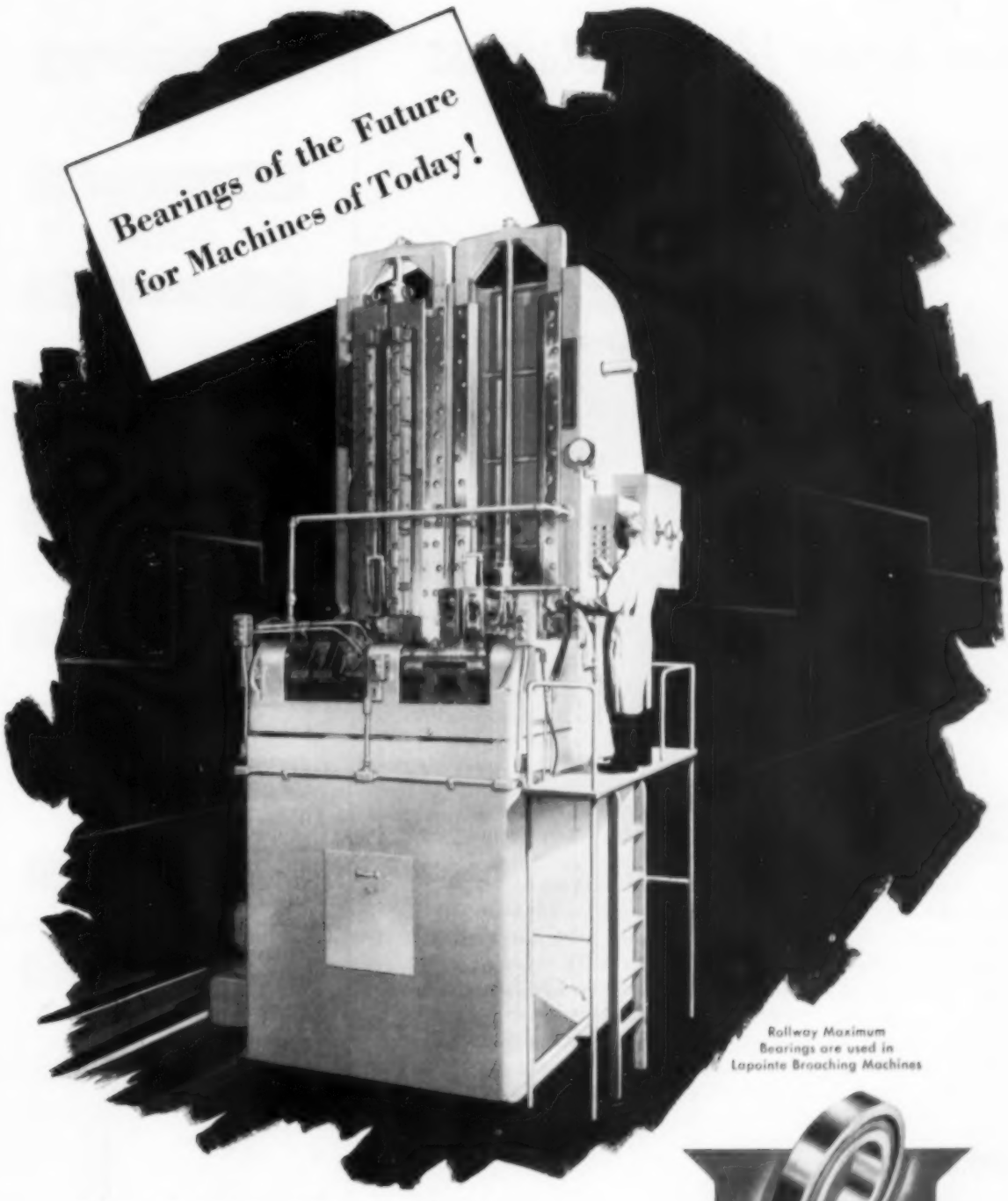
Furnace Sales Rise

Watch for industrial furnace sales to hit $109.2 million in 1956, up 10 per cent from 1955. That was the prediction made by Elton E. Staples, president of Industrial Heating Equipment Association and executive vice president of Hevi Duty Electric Co., before a meeting of the group. Sales in the first four months of this year were $38.3 million, up 50 per cent from the same 1955 period and up 170 per cent from the 1954 months. The industry is unexpectedly experiencing one of its best years because of expansion in steel and nonferrous metals and in metalworking generally. A growing market is also developing in the metals and components needed for the atomic energy program.

Straws in the Wind

Westinghouse Electric Corp.'s appliance production at Mansfield and Columbus, O., has climbed 35 per cent ahead of the prestrike level . . . Tampa, Fla., Local 108 of the International Brotherhood of Electrical Workers will hold a course in industrial electronics to help its members prepare for advances in the trade . . . Barium Steel Corp. has borrowed $5 million from General Electric Co.; as part of the deal, Barium will supply GE with some of its steel for the next five years.

Bearings of the Future for Machines of Today!



Rollway Maximum Bearings are used in Lapointe Broaching Machines

Rollway roller bearings regularly offer performance capabilities for more than the needs of today. They are continuously anticipating the operating requirements of years ahead.

Wherever bearing precision and load values are important in your plant or products – for original equipment or replacement service – call on Rollway *bearings of the future*, to give you the utmost performance in your machines of today. Rollway Bearing Company, Inc., Syracuse 4, N. Y. Manufacturers of a complete line of radial and thrust cylindrical roller bearings.

ROLLWAY®
Maximum
ROLLER BEARINGS

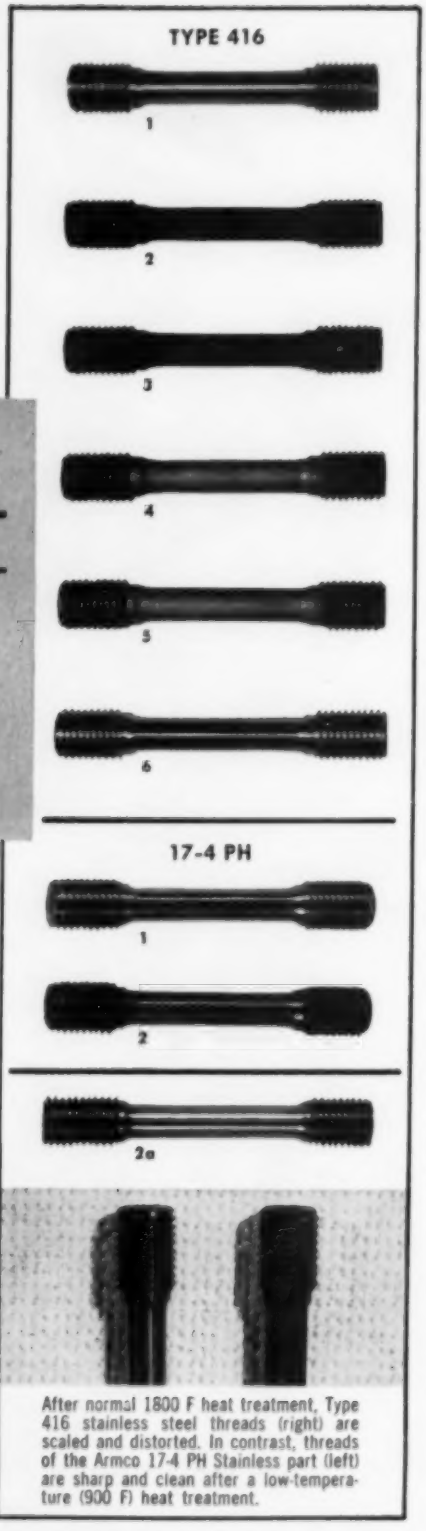
ENGINEERING OFFICES: Syracuse • Boston • Chicago • Detroit • Toronto • Pittsburgh • Cleveland • Milwaukee • Seattle • Houston • Philadelphia • Los Angeles • San Francisco

How Armco 17-4 PH Stainless

may help you eliminate 4 costly shop operations

Steps in Production of Specimen Parts With Same Tensile Properties

Type 416 Stainless Steel	Armco 17-4 PH Stainless Steel
1. Rough machining	1. Finish machining
2. High temperature heat treatment—about 1800 F	2. Low temperature heat treatment—850 to 900 F
3. Stress relieving	2A. Light pickle (needed only when appearance is vital)
4. Pickle	
5. Straightening	
6. Finish machining	



After normal 1800 F heat treatment, Type 416 stainless steel threads (right) are scaled and distorted. In contrast, threads of the Armco 17-4 PH Stainless part (left) are sharp and clean after a low-temperature (900 F) heat treatment.

If you machine stainless parts that must have high strength and hardness, here's a special Armco Stainless Steel that can cut as many as four operations from your shop practice.

It's Armco 17-4 PH, a special stainless steel that can be finish-machined and then hardened fully with a *low-temperature* heat treatment. *There's no scaling or distortion.* Parts can be completely finished in just two operations.

In the production of these stainless parts, for example, a switch from Type 416 stainless to Armco 17-4 PH eliminated 4 steps—stress relieving, pickling, straightening, and a final machining operation.

But that's not the whole story. Not only does the finished 17-4 PH part have the same tensile properties as the Type 416 stainless part . . . *it has better corrosion resistance.*

TWO PH GRADES

Armco 17-4 PH is available in billets, bars and wire. Its companion precipitation hardening grade, 17-7 PH, is produced in sheets, strip, plates, bars and wire. For full information about these special Armco Stainless Steels, just write us at the address below.

ARMCO STEEL CORPORATION

1496 CURTIS STREET, MIDDLETOWN, OHIO

ARMCO

SHEFFIELD STEEL DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Credit Too Tight?

There's growing apprehension that the Federal Reserve Board's policy on rediscount rates may have side effects more devastating than the inflation it's supposed to check.

On Apr. 15, 1955, the FRB raised the rate on money it advances to banks for lending from 1½ to 1¾-per cent. Four succeeding jumps have brought the rate up to 3 per cent at Minneapolis and San Francisco and to 2¾-per cent at ten other FRB banks.

Here's how the executive officer of one of the nation's leading banks reports to us on its effects:

"The loan situation is tight. Our loan position a year ago was $372 million. Now it's $488 million. That's up $116 million, or 31 per cent.

"In the meantime, our deposits have declined relatively. Our daily sheet showed $912 million a year ago. Now the figure is $990 million. That's only up $78 million, or 8.5 per cent.

"Now we're in the spot where we have the largest percentage of loans to deposits since 1933.

"The current prime rate on commercial loans with good collateral is 3¾-per cent. That means prime names with AAA credit beyond any question; seasonal use of the money for 90 days or so; and satisfactory balances on deposit.

"Depending on the line of credit and without all the above favorable factors, the rate is higher. For a $250,000 to $500,000 line, the rate is 4 per cent. For a small concern with $50,000 credit, it is 5 per cent. Banks in smaller cities get 5 to 6 per cent.

"Like other banks in town, we borrow from the 'Fed' but never in fixed amounts over a period. We didn't owe it a nickel yesterday; three days before we were in for $12 million. If the ten other FRB banks raise their rate to 3 per cent, we would raise our rates further on loans.

"Higher interest rates on loans haven't affected industry's building and expansion plans yet, but they could be a dampening factor."

What the banker tells us is echoed by many others:

General Motors' President Harlow Curtice blames the FRB's credit policies for part of the dip in auto sales and says business may decline if it doesn't reverse its policies. The National Association of Real Estate Boards reports money available for mortgages is down to "zero" and predicts interest rates will go from 5 to 6 per cent. Secretary of the Treasury George M. Humphrey says he would not have made the last raise in FRB rediscount rates. Businessmen are advised not to prepay existing loans for they may need the money later.

Evidence accumulating indicates that the FRB has pulled the noose too tightly on the legitimate extension of credit needed to assure continued growth and prosperity.

It's a situation you'll need to watch—and protest!

Irwin H. Such

EDITOR-IN-CHIEF

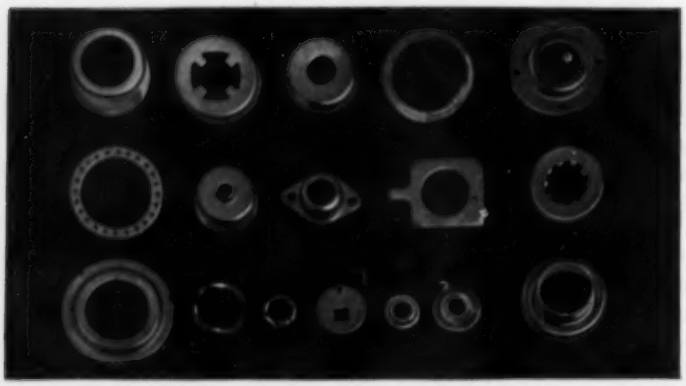
100,000 Washer Dies *at Your Disposal*

In the purchase of special washers to meet your specific requirements, an important item of initial expense is *die cost.* In addition, the time factor that enters into the designing and building of special dies to conform to your blue prints can prove costly in terms of curtailed production of the equipment on which the washers are to be used.

Here at our Milwaukee Wrot Washer Plant we have available what we honestly believe to be the world's largest inventory of Washer Dies . . . *more than 100,000 different* dies covering almost every conceivable type of washer. These dies, accumulated over a period of 68 years, are at your disposal *without cost* . . . ready for immediate production of washers in all classifications covered by this methodically indexed die inventory.

Whether you are in need of Standard or Special Washers . . . any type, any size, any material . . . consider Wrought Washer Mfg. Co. your No. 1 Source. We can also take care of your requirements for all kinds of stampings.

Let us quote on your washer and stamping needs.



WROUGHT WASHER MFG. CO.

THE WORLD'S LARGEST PRODUCER OF WASHERS

2103 SOUTH BAY STREET • MILWAUKEE 7, WISCONSIN

A 8590-1-PA

BENJAMIN F. FAIRLESS
President, AISI

JOSEPH L. BLOCK
President, Inland Steel Co.

JOHN A. STEPHENS
Vice President, U. S. Steel Corp.

ROBERT S. LYNCH
President, Atlantic Steel Co.

Trouble Ahead for Steel?

At AISI meeting Fairless warns the industry of inflationary tendencies. Block asks for a long-term contract with labor. Below-average earnings cited as trouble spot

UNLESS COST inflation is halted and the depreciation problem is given "good and just" legislative treatment by Congress, the steel industry may be in for a lot of trouble over the next few years, reports Benjamin F. Fairless, chairman of the executive advisory committee, U. S. Steel Corp., and president, American Iron & Steel Institute.

Speaking at the 64th general meeting of AISI last week, Mr. Fairless said the industry will have to spend $1.1 billion to $1.5 billion in each of the next five years merely to replace obsolete and worn-out equipment. The amount the industry can recover under depreciation provisions of existing law is $3 billion short, he said.

Inflation Roots—It would be unsafe to count on an early end to the new peacetime inflation, Mr. Fairless believes, because inflation has basic roots. (He said they are labor unions and inflationary monetary conditions.)

In 1955 the steel industry spent more than three times as much as it did in 1940 "to provide a man with an hour of work and supply him with all the things necessary to do his work," he said.

"The second root of inflation," Mr. Fairless continued, "is the national policy which, in effect, requires the Federal Reserve Board to create what might easily prove to be inflationary monetary conditions whenever any serious unemployment threatens."

Annual Affair—As a basis for long-term labor peace in steel, Joseph L. Block, president, Inland Steel Co., advocates a contract "which will be firm for a period of years and still be equitable to both parties."

Other industries have made such contracts, "surely steel can," Mr. Block added. Year after year, steel has had the "dubious choice between a nationwide strike or a dose of inflation."

If the annual conflict continues, he foresees a dangerous public demand for some permanent method of settling industrial problems by compulsory arbitration, and possible government control of wages.

Economic Issues—There is "a relatively narrow area" in which bargaining between union and management should take place. The area too often is somewhere between an empty offer by management and an extravagant demand by labor, Mr. Block said.

"Management's offer should enable the worker to share in the benefits of future increased productivity, based on long-range experience. Labor's demand should be governed by a reasonable expectation of what productivity increases will be. To go beyond this bench mark is to invite inflation."

Below Average—The steel com-

A. F. MOHRI
Chief Metallurgist, Stelco

M. A. LEISHMAN
Works Manager, Stelco

. . . presented papers at the technical session on finishing

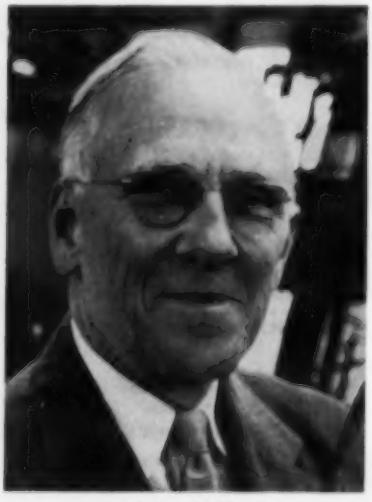
panies cannot absorb a wage increase this year, because their price and profit situation will not permit it. Even in 1955, reported Mr. Block, steel's greatest year of production and profits, the industry reached only the average of all manufacturing in earnings and was "far below many others, ranging from soap and paint to nonferrous metals, airplanes and automobiles."

"In most years," he added, "earnings have been much less than the average."

The industry must have better earnings to grow, Mr. Block concluded, and "grow it must."

Spokesman — Observing that "we have just completed the first century of the steel age," Max D. Howell, executive vice president, AISI, said that "the steel industry stands in the midst of a fast revolution in scientific progress, a rocketing American population, a revitalized free world and the ever present requirements of national defense. From all these forces will come new and greatly expanding demand over the next quarter of a century."

J. H. STRASSBURGER
Assistant V. P., National Steel Corp.



E. W. DAVIS
Consultant, Reserve Mining Co.

. . . presented papers at the technical session on raw materials

Reporting on AISI activities, Mr. Howell said there are now 55 active committees conducting technical and general studies.

Regional Spurt—The southern market is growing, declared Robert S. Lynch, president, Atlantic Steel Co., Atlanta. Steelmaking capacity in the South has jumped 70 per cent in the last decade. New capital is being generated, Mr. Lynch reported, and it is being made available to well managed industry on favorable terms.

Increasing competition for a share of the southern market is certain to spur continued industrial expansion—expansion, which, in turn, will create still more markets, he said.

Raw Materials—"Backing this industrial expansion is a supply of raw materials of great national importance. Production of synthetic fibers, for instance, has become almost a southern industry. Today, 50 per cent of the nation's minerals are produced in the South, including sulphur, magnesium, titanium, petroleum and coal.

"There is also a majority of the nation's petrochemical plants, over 50 per cent of its ammonia production, a large amount of its timber output, a steadily increasing share of its wood pulp and paper production and a large part of its atomic power," Mr. Lynch said.

AISI Sessions—Other events of the AISI meeting included two technical sessions—one on finishing operations. A. S. Glossbrenner, vice president, Youngstown Sheet & Tube Co. was chairman. The other was on blast furnaces and raw materials, with H. W. Johnson, vice president, Inland, as chairman.

W. T. Rogers, product engineer, Lorain Works, National Tube Division, U. S. Steel, received the institute medal for his paper, "Coke Quality and Blast Furnace Operation Practice." A. F. Sprankle, metallurgical engineer, steel and tube division, Timken Roller Bearing Co., Canton, O., won the regional technical meeting award for his paper, "The Effect of Deoxidation Practice and Hot Work Reduction on the Occurrence of Magnaflux Indication in the 4340 Type Steel."

An industrial relations session

was headed by John A. Stephens, vice president, U. S. Steel. Gen. Alfred M. Gruenther, USA, supreme commander, Allied Powers, Europe, spoke on, "NATO—Power for Peace."

The Schwab Memorial Lecture was given by Dr. Arthur H. Compton, professor of natural philosophy, and former chancellor, Washington University.

American Discovery—Dr. Compton termed the knowledge of how to use technology to release men from ignorance, destitution and disease as the "great American discovery," something to be shared with the rest of the free world as a weapon against communism.

AISI AWARD WINNERS

W. T. ROGERS
Product Engineer, National Tube Div.

A. F. SPRANKLE
Engineer, Timken Roller Bearing Co.

Distributors' Profits Slide

With net down to 2 per cent of sales, industrial distributors are looking to manufacturers for help. Review of distributor relations may save trouble

IF YOU SELL through distributors, better take a close look at your relations with them.

Many are dissatisfied. They're squeezed on one side by rising costs and on the other by low profit margins.

Squeeze—Industrial supply distributors say their overhead in the last two years has risen from 15 per cent of their sales dollar to 20 per cent, cutting their net profit to 2 per cent or less of sales.

The distributors have some positive ideas on how their lot could be improved. They voiced them at the Triple Industrial Supply convention at Atlantic City, N. J., last week. The three participating groups were the American Supply & Machinery Manufacturers' Association Inc., the National Industrial Distributors' Association and the Southern Industrial Distributors' Association.

Suggestions—Alfred F. Riecken, Orr Iron Co., Evansville, Ind., implored manufacturers to give serious consideration to: 1. Prepaid transportation in full. 2. Two per cent discounts for cash payments. 3. Simplified pricing and net pricing (either or both). 4. Decimal packaging (packing in units of ten). 5. Re-usable cartons. 6. A just and fair margin for stocking and selling merchandise.

In addition to asking for an increased margin of profit, Lloyd B. Mize, Industrial Supply Corp., Richmond, Va., called for manufacturers to: 1. Adopt a strong resale price policy and to enforce it so price cutting will be prevented. 2. Give faster service on emergency shipments. 3. Strengthen policy in selecting and adding distributors, so present distributors will not be crowded out. 4. Improve contact with distributors.

Self Help—The industry is trying to solve its problems. Thirty-two distributors and their associations are spending $30,000 to hire management consultants to see how operating costs can be cut and service improved.

Mr. Riecken asked the manufacturers: "Before you establish a second distributor in an area, do you go to your old outlet and ask him to expand so that you can get your share of the industrial growth in that area? If you don't, you may think you are establishing a second distributor, but actually you are causing your old distributor to lose interest in your product."

Sales Aids — Industrial Supply distributors say they also need more effective sales aids in the form of: Direct and correct sales advertising and better sales meetings (preferably the clinic type).

The distributors also want the manufacturers to supply well trained men to help their salesmen.

Big Factor — Mr. Mize pointed out that manufacturers are no stronger than their sales organizations.

While many distributors are small businesses, their aggregate is big business. From $890 million in 1939, their sales grew to $4 billion in 1955. Part of that increase, of course, is inflation. And inflation is one of the vises squeezing the distributors. Their dollars don't go as far as they once did in paying operating costs.

Another View—Fred C. Emerson, Spartan Saw Works Inc., Springfield, Mass., gave a manufacturer's view of the distributors' plight. He pointed out that while distributors operate on margins, manufacturers don't have such a distinct basis of profit. The latter, he explained, take materials, make them into products and hope there will be a profit.

The three associations elected new officers for fiscal 1956-57. Charles T. Jordan, vice president, Charles Parker Co., Meriden, Conn., was elected ASMA president. Presidents of NIDA and SIDA, respectively, are Frank M. Cruger, Indiana Manufacturers Supply Co., Indianapolis, and Ashley DeWitt, president, Briggs-Weaver Machinery Co., Dallas.

PAs Feel Economic Pulse

Republic's Charles White sees dip in steel operating rate to 85 per cent in third quarter, back up in fourth. Janeway sees sharper drop and bigger recovery

"WE HAVE no doubt about a letdown in third quarter," says Charles M. White, president of Republic Steel Corp. But, he adds, the steel operating rate will not go below 85 per cent, after which it will bounce back up to near the first quarter rate. The steel executive told the National Association of Purchasing Agents in Cleveland last week that new orders for the third quarter have been coming in at a rate only 8 to 10 per cent below the company's capacity.

Mr. White said that three things in particular are worrying the steel industry: 1. Depreciation policies are unrealistic now that fast amortization is no longer available for new capacity. 2. The industry is nearing the point where it is impossible to gain new capacity by rounding out existing facilities. New plants will have to be built from the ground up at increased costs to gain the extra capacity required in the next ten years. 3. Steel is in the squeeze of rising costs and an antiquated pricing system. Result: Steel is underpriced today.

Cost Quadrupled—He estimated expansion will average 3.5 million tons annually until 1965. "The over-all cost of expansion has taken us all by surprise," he said. In expanding present facilities, the cost is about $85 a ton. To start from scratch, the cost will be $325 a ton. He called for a reappraisal of steel's pricing system to meet this added cost. "If the steel industry can get a fair enough profit, it will be able to expand fast enough to support the demands of the rest of the economy," he said.

Eliot Janeway, New York economist, told the convention that he expects a "deflation within an inflation" during the third quarter, leading back up to a fourth quarter that will be the start of "something bigger than anything we've ever thought of." But the deflation will be no 20 per cent affair. "It's taking the form of a stampede. Strikes are infectious. There is a buyer's strike right now, whether by choice or otherwise," he said. We'll bounce off the bottom sometime in the third quarter, he believes.

Boom Intact—Mr. Janeway is in general agreement with the panel of economic experts which told the convention that some dip would come in the latter part of 1956, but that the general trend is certainly upward for at least the next 15 years. Mr. Janeway says this "stampede" is going so fast that the steel industry's operating rate won't even be able to get down to 50 per cent before it has to start back up for the fourth-quarter boom.

H. Stafford Kellam, purchasing agent, Trumbull Components Department, General Electric Co., has been elected president of NAPA for 1956-57

Nonferrous metals are headed for better times, according to the association's committee on that subject. Metal by metal, here is the outlook:

Aluminum: Supply will be easier for the rest of the year because of the government's relaxing of stockpile deliveries; the slackening in demand from the automotive industry; the coming expansion in the industry. The long-range price trend is down, although there could be an increase this year after wage negotiations.

Copper: Barring strikes, production will exceed demand this year, and the price will come down below the 40 cent level but probably not to the 30 cent level prevailing in 1954.

Lead and zinc: Supply—domestic, secondary and imports — will be sufficient, again barring strikes. The price will remain stable as long as the government continues to stockpile the metals. The view was expressed that this will continue at least until Nov. 4.

Brass and bronze: Anticipation of price declines is causing some cancellations and delays in delivery dates. Copper-bearing metal prices will go down in June, then up, maybe to higher levels than we've seen.

Tin: Price will be stabilized between 90 cents and $1 a pound, with a tendency toward the lower side.

Nickel: As long as the economy expands at its present rate and consumers insist on decorating their products with "gingerbread," nickel will be tight even after the end of stockpiling. The price will remain stable.

Distributors Gain

"Close study of market situations is paying off in better profits," reports Thomas A. Fernley Jr., executive secretary, National Association of Sheet Metal Distributors.

At the association's 46th spring meeting in Pittsburgh, the question asked most often: How can we improve our profits?

No Price Wars — "Know your costs, add a fair margin of profit and don't slash prices," was Mr. Fernley's recipe for prosperity.

John R. Leary, architectural division, Aluminum Co. of America, was optimistic: "In 1955, 14 per cent of all aluminum sheet, 25 per cent of wire, rod and bar and 5 per cent of extrusions went to customers through distributors. By 1960, 20 per cent of the sheet, 30 per cent of wire, rod and bar and 7 per cent of extrusions may move through distributors."

Capacity is strained as Industrial Nucleonics learns . . .

How To Double Sales Yearly

STARTING from scratch, how do you build a 300-man company in six years in competition with behemoths like General Electric Co. and Westinghouse Electric Corp.?

Industrial Nucleonics Corp., Columbus, O., has done just that. It was founded in 1950 to make nuclear thickness gages. Since 1953, sales have doubled every year, now have reached multimillion dollar proportions. The firm—founded by Wilbert E. Chope, now president; Henry R. Chope, executive vice president; and George B. Foster, engineering vice president—is doing over half the total business in nuclear gages.

What's the secret? Management and product have been carefully tailored to the job.

Lesson—The steel industry was I.N.'s first sales target. Used to continuously control sheet thickness on rolling mills, Accuray systems have since saved as much as $600,000 a year for an equipment investment of just $56,000. But first designs had to be modified to stand up under mill service. "By the time we were ready," explains Mr. Foster, "Korea had come and tonnage was more important than control."

Wilbert Chope went to Akron, where Accuray was first proved for controlling rubber thickness on tire fabric. But even there, the partners had to tailor the installations to operating conditions and do a job of educating both workers and management on the operation of the equipment.

Result — I.N. management learned that it takes as much engineering to make a sale stick as it does to write the order. From this experience came the company's industry-manager concept.

While Wilbert Chope was in Akron, the partners turned their attention back to steel, also to plastics, paper making and cigaret industries. Distinct departments were set up for each industry.

Jim Reider, 28, is manager of the metal division. He forecasts sales, competes for his operating budget with the other industry managers and is responsible for showing a profit on his entire operation. He has Accuray on more than half the country's 5-stand tandem mills.

Expansion — He estimates his sales will quadruple in the next five years. Similar predictions are being made by the other industry managers. "Nobody wants to be first," says Mr. Foster, "but nobody wants to be last either."

So far, the company's expansion has been financed from sales. Top management intends to keep it that way. A new plant is going up to house the complete operation. Says one executive: "We can't build as big as we know we'll need in five years, but we're designing with expansion in mind."

Goals—The Chope brothers have lost none of the pioneering spirit that took them into the new field of nuclear gaging. "Our next step," says Henry Chope, "is to give management better working control over its costs."

Right now, Industrial Nucleonics can build a rolling mill system that would take overhead, raw materials and operating costs, give the superintendent a continuous measurement of each cost factor against a standard, then combine them to give a continuing measurement of profit. And if industry gave the go-ahead, the brothers believe that they could put a meter on a president's wall to tell him how much profit his company is making any time he looks at it.

Kaiser Expands at Fontana

Kaiser Steel Corp. will spend $113 million to boost output of its Fontana, Calif., mill. "By early 1958," says J. I. Ashby, vice president-general manager, "we will increase production of steel ingots and finished steel by 40 per cent."

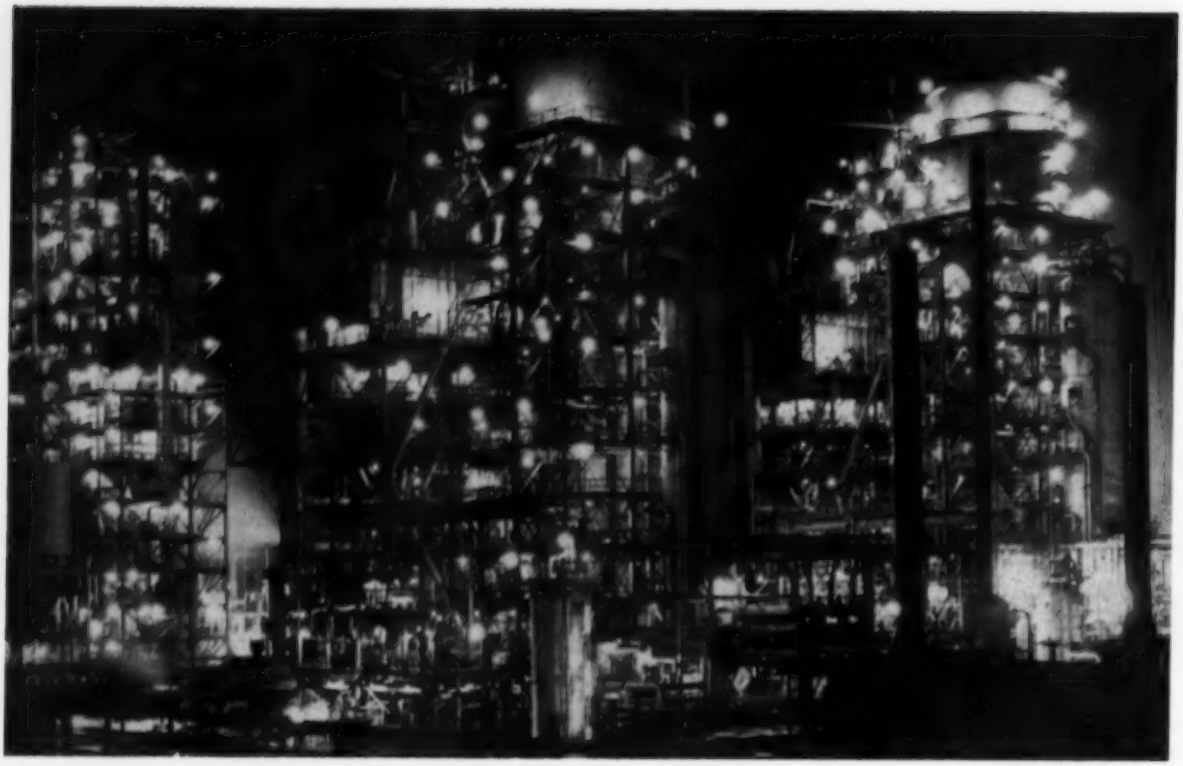
When the expansion is completed, finished steel capacity at the Fontana mill will be 1,528,000 tons annually, compared with today's 1,084,000 tons. Mr. Ashby adds that the biggest capacity boost will be in tin plate, steel plate, hot-rolled sheet and structurals.

Process Reduces Tin in Cans

The tin needed to make 10 billion tin cans may be reduced as much as 5,260,000 lb by a new process of the American Can Co., New York.

Dr. Roger H. Lueck, American Can's vice president in charge of research and development, says the process, margin plating, consists of tin plating only the narrow margins of the steel plate that form the soldered side seams. Except for the margins (no more than 3/16-in. wide), the cans are made of enameled steel plate.

The process requires less than 2 per cent of the tin normally used.



Standard Oil Co. (N. J.)

More dollars for refinery improvements this year as . . .

Oil Firms Spend $850 Million

THE EMPHASIS in the oil refining industry this year will be on the improvements. Refinery capacities will be expanded, but oil companies want particularly to upgrade their gasolines for today's high compression engine. Lubricating and cutting oils for industry will also get more attention.

Of the industry's estimated capital expenditure of $5.6 billion this year, $850 million will be for refining facilities. The budget last year was $4.8 billion, and $720 million went to refining.

Demand—Reformers and other quality processing equipment will be in special demand. More alkylation capacity will be needed to meet the high octane gasoline requirements. The trend to install more coking units and hydrogen treating equipment will continue.

Affiliates of Standard Oil Co. (N. J.) will spend about $130 million this year on domestic refinery expansion and improvement. From 60 to 70 per cent of that will be for quality processing apparatus.

Three-Year Plan—Socony Mobil Oil Co. has a $232-million program for 1956-1958. Last year it spent $30 million on refining.

Most of Gulf Oil Corp.'s $70 million for refineries this year will go to improve gasoline and home heating oils. The firm estimates its capital expenditures will be $350 million. It spent $275 million in 1955.

The Texas Co.'s capital expenditures will also run close to $350 million, compared with $263 million in 1955. In 1954 the company spent $72 million for refinery expansions and improvements; in 1955, $37 million; this year it will spend $63 million.

To Spend Less—Sinclair Refining Co. and Shell Oil Co. will spend less money this year than last on refineries. Comparisons: Sinclair, $30 million this year versus $35 million last year; Shell, $25 million this year versus $50 million last year.

Crude Capacity—By 1957 U. S. crude oil capacity will be 9 million barrels a day, compared with 8.4 million in 1954 and 8.5 million in 1955. The sharp increase will come from the completion of several large units this year.

The total demand for petroleum in the U. S. will be up 4.5 per cent from that of last year, which was 8.4 million barrels a day; a gain of 60 per cent is predicted over the next 20 years.

Outlook—Dr. Cecil L. Burrill, Standard Oil (N. J.) believes there will be new products in the future, but that the pattern of demand will generally remain the same. He predicts a growing use of jet fuel. Gas turbines for autos may affect patterns of demand.

Tireless TV Saves Dollars

It goes where no human can go; tests where they dare not test; saves manpower and time by making quick inspections of large and distant areas

INDUSTRIAL television is winning an enthusiastic audience in the metalworking industry.

"This year will be one of the first really big ones for TV in steelmaking," report officials of General Electric Co.'s electronics division, Syracuse, N. Y. "We feel that metalworking will be a key user."

Applications—Metalworking uses TV for three main purposes: 1. Visual inspection in areas too hot, radioactive or otherwise dangerous for humans. 2. To obtain an overall view of a manufacturing operation from an inaccessible location. 3. To save manpower and time by quick inspections of distant areas.

Too Hot—A southern industrial firm testing materials for missiles and supersonic aircraft observes tests over a television screen because high temperatures keep personnel 500 ft from the work. Other researchers use TV to check reactions inside furnaces.

"Industrial television is often the only safe, practical means of viewing dangerous activity," researchers at Radio Corp. of America, Camden, N. J., add. For example, at the Umatilla Ordnance Depot, Ordnance, Oreg., RCA television protects lives in the dangerous task of rebuilding World War II bombs. An operator in a bombproof shelter dismantles bombs by remote control while watching the work over television.

Over-All View—At U. S. Steel Corp.'s 80-in., hot-strip mill in Gary, Ind., and at Columbia-Geneva Steel Division's Geneva, Utah, 132-in. strip mill, operators guard against bends by watching strip movement over television. Result: Fewer cobbles.

Dage Television Division, Thompson Products Inc., Michigan City, Ind., installed a closed-circuit system at Great Lakes Steel Corp., Detroit, to enable workers to make cuts of maximum length when shearing hot slabs.

Other applications demonstrate possible savings. At American Can Co.'s Cincinnati machine shop, an RCA camera peers through a microscope at scraper blades used in lithography coating presses. Images are magnified 288 times and projected on a television screen. "This installation improved product quality and production 100 per cent," reports the plant manager, F. J. Connelly.

Auto Research — Engineers at General Motors Corp., Detroit, use TV cameras mounted underneath automobiles to watch action of the car's suspension system. Pictures are flashed to TV sets inside the car or in executive offices.

The 35,000-ton forging press at Aluminum Co. of America's Cleveland works is so powerful that an off-center load could throw off accuracy. A TV camera in the press foundation watches a hydraulic mechanism indicating eccentric loading. The receiver is in the press operator's control station.

Distant Points—At U. S. Steel's Fairless, Pa., works, operators control movement of slabs in a hot-strip mill by watching the distant furnaces on a TV screen. One operator controls the passage of plate through a furnace for processing, and another man oversees a complete plate-finishing-shearing operation with TV at Lukens Steel Co., Coatesville, Pa.

"Continuous observation of the entire furnace line is essential for maximum safety in loading and carrying alloy plates, but the line has 'blind spots' not visible from the overhead booth," explains L. M. Curtiss, Lukens general works manager. TV cameras scan "blind spots," some of which are 600 ft away.

Future — Reports an eastern steelmaker: "We're using TV now, and we'll use it more in the future. In a few years we may have color sets to watch furnace reactions. Cost is often surprisingly low, and dividends are high in form of improved quality, greater safety and quicker production."

Sales outlook: Industrial television equipment sales promise to be substantial this year and gain rapidly in a short time. Many new metalworking uses will appear.

Lukens Steel Co. furnace line operator uses TV to switch plate to next process

Atoms Wait for Congress

Civilian atomic plant operators need government backstopping on insurance . . . The big gear and turbine program will start soon . . . The Treasury estimates a $1.8-billion surplus

LARGE-SCALE atomic power will be three steps closer to realization if Congress gets around to setting up a government risk-taking plan for the private atomic energy industry.

That's the consensus of would-be atomic power plant operators who already have more than $300 million involved in planning and construction of nuclear power plants and research. The private insurance industry is prepared to underwrite $65 million in public liability, the largest such policy ever contemplated, but the power companies want to be sure of government backstopping just in the unlikely event that an atomic plant might backfire.

Congressmen on the Joint Atomic Energy Committee apparently are in basic agreement that some kind of government aid is needed—but aren't in accord on how much over-all, or on how much the individual atomic power plant operator should be obligated for.

Turbine Tool Program Set

Watch for contract letting to start in the long-in-preparation turbine tool production program. It's aimed at rounding out current manufacturing facilities for big gears and turbines and provides for some $40 million worth of long lead time tools and accessory production items.

The total program was originally estimated at up to $70 million, but it will run about $50 million—the $40 million for tooling, plus $10 million for long-term maintenance. Planners say the cut was possible because of provision for use of some inventory tools, and because some costs will be less than originally thought.

The program will contain a provision that the tools can be leased for defense or defense-supporting production; there will also be an option to buy. More than 300 machine tools and accessory production items are included.

The Budget Bureau has been sitting on the program for about five months, but is about to let it go through. The snag reportedly centered on why certain apparently short lead time items were included in what is essentially a long lead time tool program.

The answer: Items that are in the off-the-shelf category now probably would be in the long lead time category under mobilization conditions. Some minor, but essential, accessory item is often needed to put an expensive, long lead time tool into operation.

Missile Memo

Spending for guided missiles may zoom skyward even faster than expected. The administration is asking for $1.8 billion in fiscal 1957, almost double this year's $938 million and more than five times last year's $345 million.

If present emphasis on long-range missile development pans out, watch for requests for still more funds.

Tax Cut in 1957?

An official Treasury estimate of a $1.8 billion surplus in fiscal 1956 rekindled tax cut talk. But it quickly died down. The surplus is still too small in the eyes of influential tax policy makers, both in congress and the administration, who hold that the surplus would have to be well over $2 billion before a tax cut can be considered. Favored is a start on reduction of the $276 billion national debt.

It does, though, make a starting place for a campaign aimed at bringing a tax cut in 1957.

Watchmakers Are Test Case

Congressional probers will try to figure out if too many industries are trying to limit imports on the ground that their skills are necessary to the defense effort. The watch industry will be a test case. Domestic watchmakers will have to come up with a double-barreled defense to cope with: 1. A Joint Economic subcommittee that reportedly favors lower tariffs. 2. The efforts of Swiss watch importers.

Civilians To Take Over

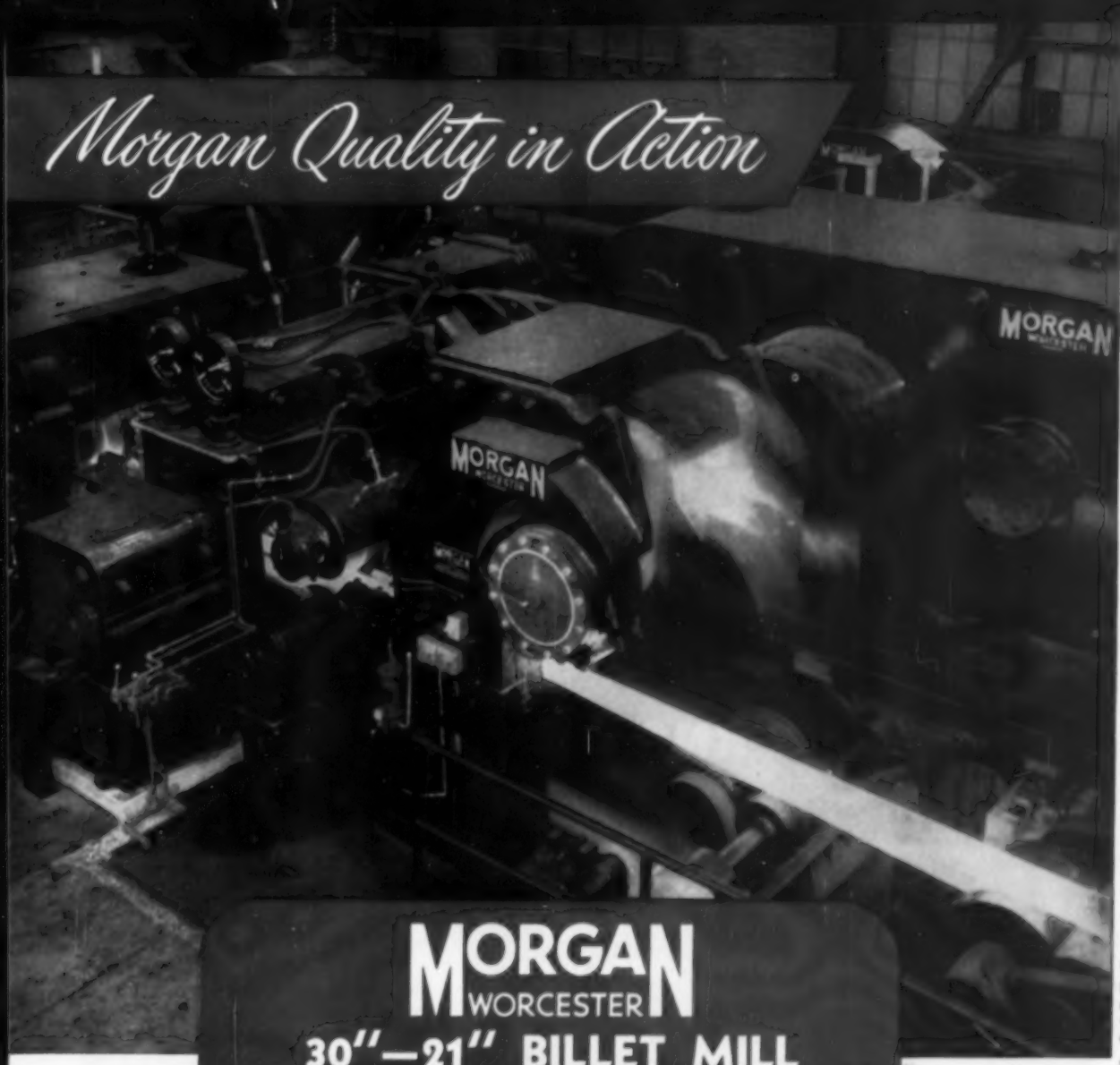
Getting the government out of business seemingly has a new lease on life. The House knocked out of the Appropriations Act the provision that the Defense department had to have approval of Congress before discontinuing business-type activities.

Here and There

• Representatives of four metalworking industries will attend a combined industry conference June 6 to hear Defense department officials expound on the progress the military is making in modernizing its machine tools. One comment: The modernization is more talked about than practiced. Represented will be gage and precision tool manufacturers; tool, die, jig and fixture manufacturers; machine cutting tool manufacturers; and machine tool manufacturers.

• The bulk of contracts for the government's Trigger program for machine tools should be mailed within the next month. Final approval by the military is all that's needed, and it's doubted that they can find reason to hold up the program any longer. Contract forms have already been printed.

Morgan Quality in Action



MORGAN
WORCESTER

30"—21" BILLET MILL
with No. 5 Electric Flying Shear in Action

Every Morgan Mill is developed by highly skilled technical engineers to answer the exacting demands of mass production. Morgan introduced the first successful continuous rolling mill in this country—and has consistently maintained leadership in producing quality, high production mills in this country and abroad.

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

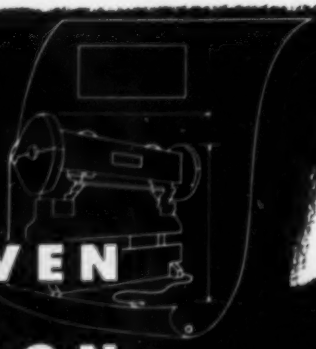
ROLLING MILLS MORGOIL BEARINGS GAS PRODUCERS
WIRE MILLS EJECTORS REGENERATIVE FURNACE CONTROL

English Rep., International Construction Co., 56 Kingsway, London W. C. 2, Eng.

RM-88

MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER

MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER MORGAN WORCESTER



PROVEN DESIGN PLUS LODGE & SHIPLEY "KNOW HOW"

gives you a better brake for every dollar of purchase price

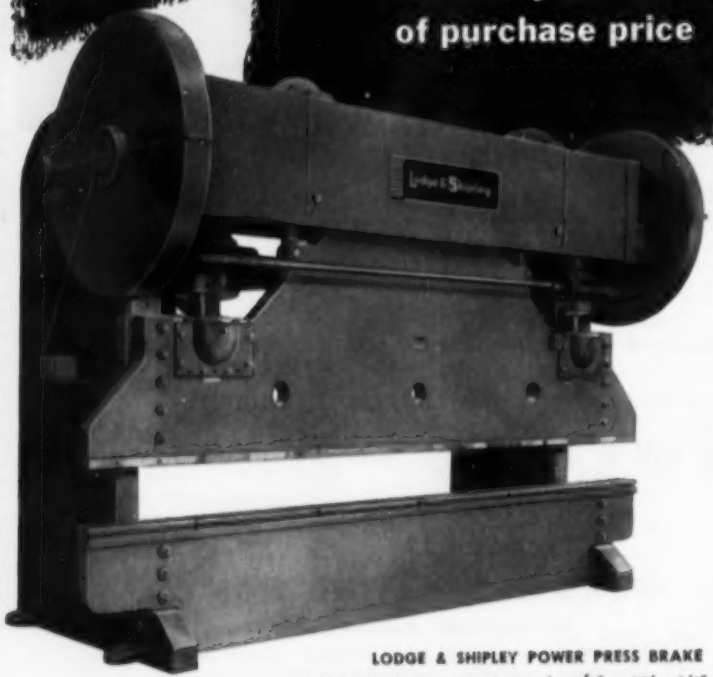
From a background of more than 100 years of experience in building heavy metalworking equipment, Lodge & Shipley is producing power press brakes equal or superior to any other.

Built to Lodge & Shipley standards of strength and accuracy, for long service and minimum maintenance, these power press brakes offer many features which contribute to cost savings.

For example, the air clutch and spring brake is specifically designed for press brake service. The smoothly operating positive clutch is installed in a heavy, balanced flywheel. When the clutch is disengaged, the disc-type friction brake is automatically applied, positively holds the ram is any position.

Give yourself a *better brake,* check the many features of Lodge & Shipley power press brakes against any other power press brake . . . then make your decision.

Write for FREE Bulletin PB-4 and the name of your nearest distributor.



LODGE & SHIPLEY POWER PRESS BRAKE
Series 350 Capacities from 8' x 5/8" to 20' x 1/4"

THE Lodge & Shipley COMPANY
3070 Colerain Avenue
Cincinnati 25, Ohio

Superior's Kowall: Caster of Quality

"WHEN A JOB comes in, stick with it until you know everything is right," declares 35-year-old Nicholas Kowall, superintendent of the steel finishing division, Superior Steel & Malleable Castings Co., Benton Harbor, Mich.

Mr. Kowall's attitude has a great deal to do with Superior's reputation as a producer of high quality castings. It's the reason he prefers a jacket to a suit coat. It also explains why he's seldom in his office. "I like to be in the plant where I can do some good," he says.

Quality—Superior's attention to quality is emphasized by Mr. Kowall, who points out that often the company won't release a job to a customer until it is positive it will meet all requirements. "We try to x-ray everything we can. That way the customer knows what's going on and can see what we're trying to do," he explains.

Mr. Kowall was graduated from the University of Alabama in 1943 with a degree in chemistry, metallurgy and ceramics. The Navy took over and put him in its research laboratory where he developed a method to quickly determine carbon content in castings.

Beginner—Discharged in 1945, Mr. Kowall was urged to stay with the Naval Research Laboratories as a civilian, but as he puts it: "I felt I had enough theory. I wanted to learn production from the ground up."

He sent applications to 50 foundries. In December, 1945, he came to Superior and entered its apprentice training program as a pattern storage man. Two years later, after working in every department and at just about every job from stock boy to ladle man, he started up management ranks as foreman of the foundry squeezer line. He was named superintendent of the steel division in January, 1954.

Neophyte—Mr. Kowall feels he is still learning. "I tell my foremen to speak up when they think I'm wrong. I like it when they do," he says. The knowledge he gains goes into a hip pocket notebook which serves as a handy reference and data file. "I like to get things down to a science," he concludes.

Mr. Kowall was born in Elwood City, Pa. He has a passing acquaintance with golf and admits he is a do-it-yourselfer. His current project is putting on new table tops in the kitchen. His wife and three daughters, ages 10, 6 and 2, are supervising that job.

Shop Rules Help Curb These Practices

1. **Timecards: Knowingly ringing another's card; repeated failure to punch one's own**
2. **Habitual tardiness or absenteeism without proper notification**
3. **Reporting for work under the influence of intoxicating liquor, or drinking on the premises**
4. **Insubordination, including refusal to satisfactorily perform any reasonable task assigned by a superior**
5. **Theft of company's or another employee's property**
6. **Fighting or disorderly conduct**
7. **Horseplay, scuffling or throwing things**
8. **Loafing or loitering**
9. **Gambling**
10. **Violating safety rules**
11. **Unsatisfactory work, including excessive scrap, damaging tools or equipment, restricting output**
12. **Use of profane, abusive or threatening language, or any threatening act toward employees or supervisors**

Rules Need Interpretation

"EMPLOYEES are individuals subject to human frailties — you can't administer shop rules under an automatic or mechanical procedure. Each case must be handled individually."

Agreement—That's the consensus of metalworking industrial relations executives. Shop rules, they point out, are most effectively administered: 1. When they are written. 2. When their number is kept to a minimum. 3. When penalties for violations are known generally but are kept flexible.

Not all companies agree that written rules are necessary. You're more likely to find fewer written shop rules in firms with less than 500 employees. In large companies the practice varies: Pullman-Standard Mfg. Co. and International Harvester Co. have no written rules; a Detroit firm has 38, including a written penalty range for each.

Personal Contact — "We've thought about having a few basic written shop rules," says C. B. Faverty, Pullman-Standard's director of manufacturing, "but we feel that without them we have a greater opportunity to develop personal contact with the employee right from the start. When a man is hired, the employment agent talks with him about company activities and policies. Then he meets the department head and finally his foreman, who explains his particular job, along with shop rules."

Few companies face serious problems with shop rule violations. Of the 12 most generally written rules (see list), the most commonly violated are tardiness, absenteeism without notification, intoxication or drinking on company premises and violation of safety rules.

Some firms make no distinction between shop and safety rules. Others have written safety rules but no shop rules. One Chicago metalworker estimates that between 30 and 50 per cent of all accidents involve some sort of safety rule violation.

Opening Day—A Detroit builder of gearmaking equipment complains that he and others in his area have "opening-dayitis" problems. On the first day of the baseball, deer hunting and fishing seasons, absenteeism becomes a serious problem. Penalties and threats of penalties failed to help. Their most successful approach has been to poll the employees to determine how many will report on that day and schedule production accordingly. One plant has even shut down completely on several occasions.

Circumstances — Determining penalties depends upon the circumstances of each case: Is this the employee's first shop rule violation? His first violation of this specific rule? Was production hindered? Was another employee injured or otherwise affected? Does the individual have a home or outside problem that may be contributory to his action? Although few companies will admit it for the record, the level of operations and the shortage or availability of labor are considerations.

Several shop rules are enforced to the letter. Carrying a weapon, fighting, theft and insubordination bring automatic discharges or extended layoffs in most companies.

The administration of shop rules and penalties is generally left to the foreman or direct line supervisor. This authority usually doesn't extend to serious penalties involving long layoffs or discharge.

Union Action — In practically all companies with a union contract, the employee is entitled to challenge the violation charge or penalty through the grievance procedure. Mr. Faverty points out, however, that Pullman-Standard's experience has been that the union enters the shop rule administration in only 2 to 3 per cent of the cases —and then it's normally not to challenge the violation but to seek a reduction in the penalty.

Most industrial relations executives advise this: If you don't have written rules and have no serious problems, don't start writing a big list now. If you are having problems, written rules and their fair enforcement can bring understanding and respect for them.

Get Set for Arbitration

NEARLY all labor contracts contain arbitration clauses. The reasons: It's recognized that arbitration is better than economic pressure as a method of resolving disputes; arbitration is a just union demand in exchange for the no-strike clause.

Most contracts call for *ad hoc* arbitration (using a special arbitrator for each case) in contrast with the selection of a permanent arbitrator for a definite period. Demands upon an arbitrator under such a process are obvious; it's little wonder that both union and management are often disappointed with results. To win more cases, James H. Jordan, Atlas Powder Co., suggested these steps to American Management Association members at the Chicago labor conference:

1. Select an arbitrator wisely. What's his experience in your industry? Study cases he has decided—try to analyze his thinking and approach to problems. Don't hesitate to call people who have used him for their appraisal of him.

2. Define the area of jurisdiction which you are giving the arbitrator through a submission agreement. This spells out exactly the questions both you and the union want answered—it prevents results from "ending up in left field."

3. Prepare a written "brief" on your position in the dispute. Regardless of how many notes the arbitrator takes during the hearings, he'll probably miss some important points.

4. The brief should contain:

   A. Factual background on the problem. Include only those facts which have been previously agreed upon by both union and company. Reason: It impresses the arbitrator with your sincerity; it shows the union you intend to handle the case in a fair, businesslike manner.

   B. Company contention. Use the problem-solving approach. What facts did you use in reaching a decision? How did your reasoning proceed, based on these facts?

   C. Union contention. What are the union's arguments? In analyzing them you may discover several arguments the union failed to give which would help its case. Don't point them out: It may embarrass the union; the union may be saving the arguments. Just be prepared to answer them effectively if they come up.

   D. Company's answer to union contention. This is the big test. Take the union's arguments in turn and show logically why they lack merit. Better yet, try to show where the demand might even hurt the union. There may be an opportunity, too, to show where the union has left some of your arguments unanswered.

   E. Summary. Emphasize your key points again. Repeat your conclusions. End it with the action you wish the arbitrator to take.

5. Use visual aids, products, models or a plant trip when you feel they will put your point across to the arbitrator better than your brief or the hearings.

6. Use a mock hearing to prepare yourself for the real thing. Set up the case problem with the people who will be taking part in the hearing. Select your arbitrator and union representative with care. The person playing the union role should prepare his case with as much care as the men representing management. The arbitrator should be impartial and adept at asking searching questions to clarify issues. If properly set up, this technique will develop shortcomings in your arguments, reveal gaps where the union's case is weak, point out mistakes you can avoid at the hearing and give participants the feel of what the hearing will be like.

• *An extra copy of this article and the article, "Rules Need Interpretation," on page 76 are available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

Atom Costs Watched

NICB is told of problems in using nuclear energy in industry; solutions to come slowly

APPLICATION of nuclear energy in industry is definitely making headway, but don't expect too much too soon.

So warned industrial leaders at the 40th meeting of the National Industrial Conference Board in New York.

Cost Factor—Noting that steelmaking requires much higher temperatures than now obtainable from controlled reactors, Charles M. White, president, Republic Steel Corp., declared: "If the potentially low nuclear fuel costs can be realized, many processes which we are studying today and discarding as uneconomic may have to be reevaluated. This is particularly true as our investment costs become higher."

Mr. White cited the competition between electric furnaces and open hearths; the possibilities of cheap electricity from the atom must be closely watched.

In Aluminum—Use of electric power from atomic sources will develop slowly for the aluminum industry, said H. E. Bakken, vice president, Aluminum Co. of America. Important uses of aluminum will develop as commercial atomic energy plants are built. Cladding of fuel elements in the reactors themselves may be one.

Needs—Charles M. Weaver, vice president, Westinghouse Electric Corp., pointed out that nuclear reaction requires a high investment and promises little early profit. He said there would be a "sizable market" for nuclear equipment for naval power within five years. By 1965 commercial equipment requirements may be close to $1 billion a year.

Auto Workers Retire

An estimated 54,500 retired workers are drawing pension benefits (as of the end of February) under plans negotiated by the UAW.

Some 48,500 are being paid under normal retirement, 2400 under early retirement and 3600 under disability retirement.

ONE OF A SERIES:

What makes a cylindrical roller bearing good?

RETAINERS

"requirement-engineered" for your kind of service

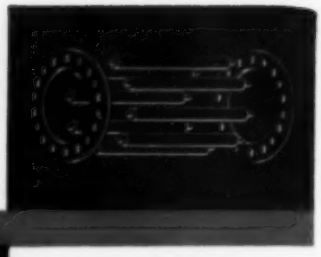
The basic parts of a roller bearing are the rollers, the races, and the *retainer* which locates and guides the rollers. There are significant differences in the design and construction of retainers, which influence bearing cost and performance. Some are simple and economical, well adapted for volume production; others are more costly but insure improved roller guidance, or cooler and smoother operation, or longer heavy-duty service. Here are the seven basic types in current use.

HYATT MAKES ALL SEVEN TYPES . . . EACH THE FINEST OF ITS KIND! **You will find complete details in HYATT General Catalog No. 150, or your nearby HYATT Sales Engineer will gladly help you choose the type best suited to your requirements. Remember, HYATT is America's *first* and *foremost* maker of cylindrical roller bearings. Hyatt Bearings Division of General Motors, Harrison, New Jersey.**

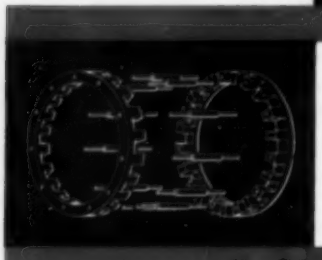
GM GENERAL MOTORS

HYATT

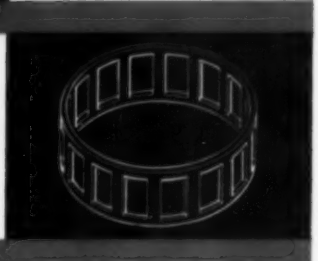
ROLLER BEARINGS



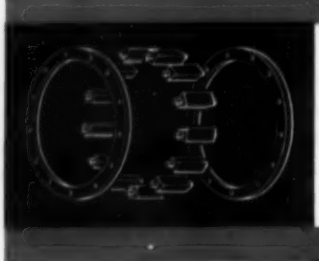
TRUNNIONED ROLLER CAGE—Economical for volume use on thin-annulus bearings. End rings are hardened steel stampings, connected by riveted bars interspersed between rollers to form an integral unit. Races can be omitted if desired.



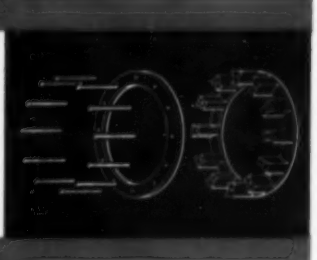
POCKETED END RING CAGE—Designed for fairly large bore bearings in heavy-duty service. Rollers are guided accurately by pockets drilled in bronze end rings. Riveted connecting bars form an integral unit, so races can be omitted if desired.



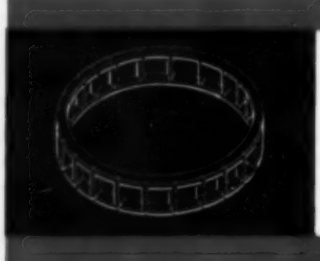
STAMPED STEEL SEPARATOR—Economical for volume use on wide range of bearings with short rollers. A single steel stamping with bars coined to conform to roller contour. Simple, open design assures large lubricant capacity and good circulation.



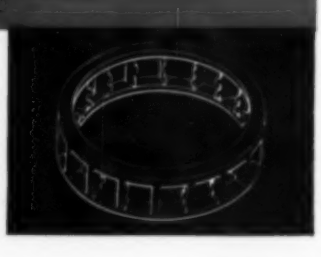
FORMED BAR CAGE—Well adapted for volume use on heavy-duty bearings. Hardened steel end rings are connected by cold-rolled shaped bars conforming to roller diameter. Insures quiet operation, better roller guidance, and the smooth surface of bars protects rollers.



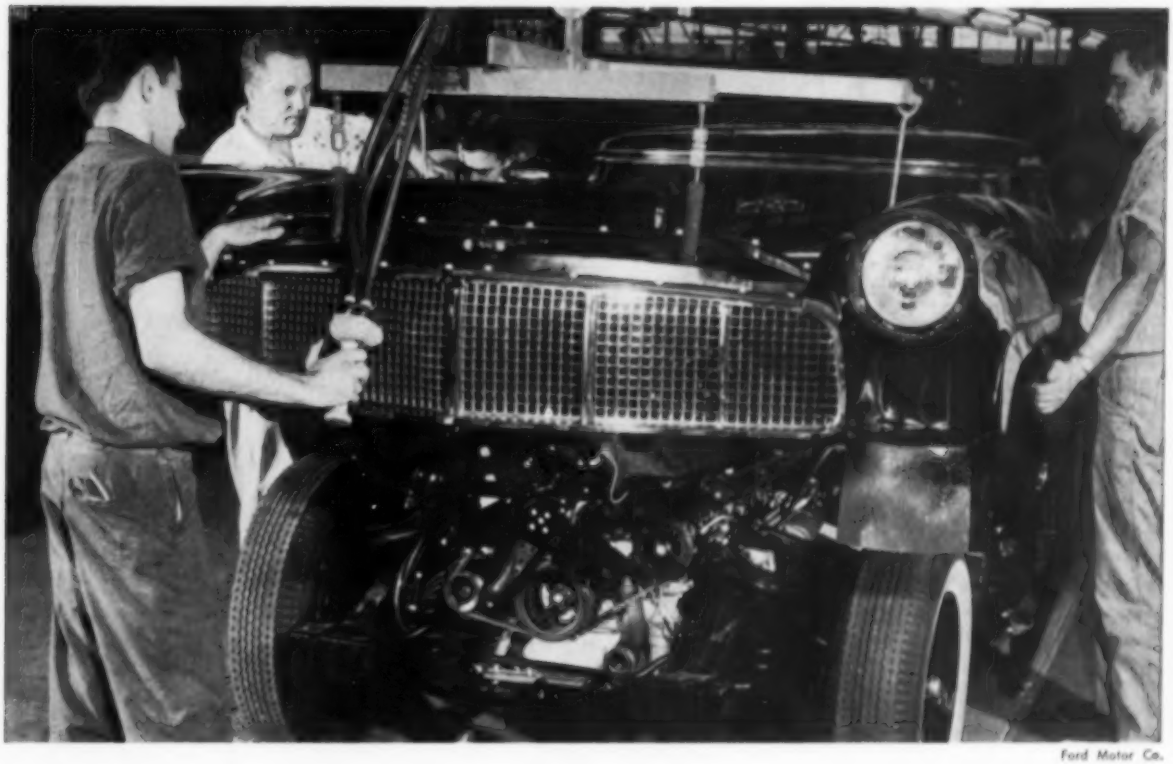
DRILLED POCKET CAGE—Used on better-grade bearings to provide extremely close control of rollers, which operate in pockets drilled and reamed in bronze cylinder. Riveted ring on one end retains rollers permanently, so races may be omitted if desired.



SEPARABLE BROACHED POCKET CAGE—Used only on finest high-speed bearings. An integral bronze cylinder with pockets broached for maximum uniformity. Insures minimum friction, better oil circulation for cooling. Rollers can be removed for inspection.



NON-SEPARABLE BROACHED POCKET CAGE—Similar to the above and offers all the same operating advantages. Used for "blind" installations where rollers must be retained with inner or outer race. Roller drop controlled by deforming bars after rollers are placed.



Ford Motor Co.

Grilles like the Continental Mark II's help to prove . . .

Zinc Holds Auto Market

ZINC DIE-CAST PARTS continue to hold their own in the automotive field, according to a recent survey by the American Die Casting Institute.

In 1950, 173 million lb of zinc were used by automotive job shop diecasters. Last year, 327 million lb were consumed, the institute claims. This year, the dip in auto production is expected to bring consumption down to 290 million lb.

Despite the temporary slump, zinc isn't slated for the inactive list as some suppliers have feared. It still has highly regarded qualities.

Example — Ford Motor Co.'s Continental Mark II is an example of a luxury car which leans heavily on zinc die-cast parts. Its 55-lb grille assembly is the largest in the industry. All told, the Mark II uses 92 lb of zinc in 61 parts—more than any other automobile except Buick.

William Gray Jr., the man who buys Continental's zinc diecastings, points out two basic reasons why the metal still proves popular with auto makers. "Zinc has manufacturing feasibility. It can be cast into intricate shapes and forms. Also, you can get a good finish on zinc."

Cost—The basic price of zinc is about half that of aluminum. Special zinc alloys and finishing operations on diecastings cut down that difference. But on an industrywide basis, it is claimed that zinc still holds the edge when total manufacturing costs are considered —on comparable parts, it is said to be as much as 11 per cent cheaper than aluminum.

The Mark II's grille is made by Electric Auto-Lite Co., Toledo, O. Ford engineers picked this company because it could maintain the quality standards they were seeking.

Specs — The extra heavy duty zinc grille gets a 0.0005-in. copper coating; a nickel coating of 0.002-in. and a final chrome plating of 0.00001-in. This isn't too different from most zinc plating processes, but there are some extra touches many auto makers don't bother with today.

Mr. Gray says that the grille is buffed between each coating of copper and nickel to rub out pinholes and defects. After the chrome is applied, the grille is subjected to a 192-hour salt spray test, three times the normal testing period.

The spec sheet states: "Coating on zinc die-cast parts shall be considered to have failed in this test if they show more than six corrosion spots per square foot that

(Material in this department is protected by copyright, and its use in any form without permission is prohibited.)

are visible to the unaided eye, or any corrosion spots larger than 1/16-in. in diameter on significant surfaces."

Future—Besides the Mark II, the industry trend shows use of zinc diecastings has increased an average of 4 lb per car in the last two years. This year there are about 40 lb of zinc diecastings on the average car. Most of the increase comes in exterior trim parts like larger taillight housings.

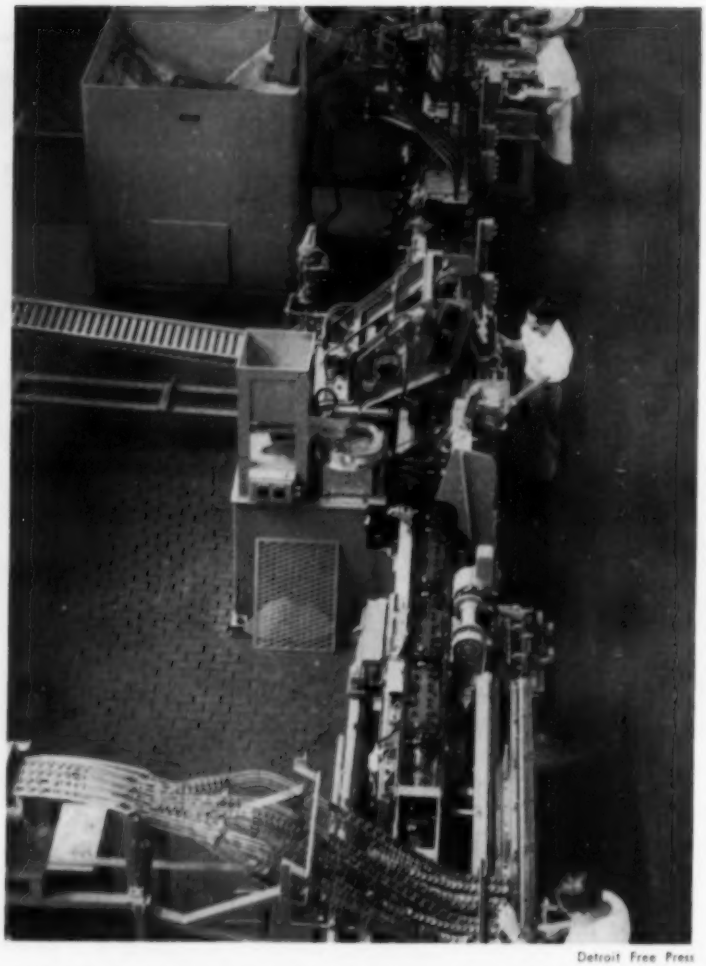
The Die Casting Institute reports: "It's estimated that in 1956, General Motors cars are using 25 per cent more zinc diecastings for headlights and taillights than in 1955."

More zinc is being used today in instrument panels, heater and air conditioning parts.

Exception — The only carbuilder which shows a drop in zinc consumption is Chrysler Corp. The average number of pounds of zinc die-cast parts in all Chrysler lines dropped from about 40 lb per car in 1954 to 35 lb this year. Exterior styling accounts for most of this decrease.

Aluminum — The current push toward more aluminum on autos has hidden the fact that zinc is more than holding its own.

Aluminum has proved itself a good material for pistons, torque converter housings, wheel covers, some types of grilles and places where its simplified finishing and tensile strength pay off.



Detroit Free Press

GM Machine Assembles Rocket Cylinder Heads

This machine is 137 ft long and assembles 75 parts for the Oldsmobile Division's engine. General Motors Corp.'s Technical Center also is working an automated lines for Chevrolet and Buick engines

U. S. Auto Output

Passenger Only

	1956	1955
January	612,079	659,508
February	555,689	674,951
March	575,530	792,436
April	547,766†	752,245
4 Mo. Total	2,291,064†	2,879,140
May		723,868
June		648,412
July		658,696
August		613,705
September		460,443
October		517,788
November		749,061
December		682,256
Total		7,933,369

Week Ended	1956	1955
Apr. 21	129,930	180,647
Apr. 28	127,277	184,279
May 5	112,730	172,031
May 12	105,654	177,287
May 19	107,011†	176,441
May 26	105,000*	167,555

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

More Hints on GM Lines

Reliable rumors have it there will be ten rather than three pinion gears in Buick's 1957 Dynaflow transmission. Reason: To spread the heavier torque strains needed for higher horsepower ratings.

From Fisher Body styling divisions comes talk that Buick and Cadillac rear windows will revert to a three-piece design which is supposed to help the wrap-around effect, cut manufacturing and replacement costs. The two strips in the rear window will continue over the roof to form ridges.

The 14-in. wheel still will make its debut on '57 models. In the GM line, look for it on the Cadillac, perhaps on Buick and Olds—not on Chevrolet or Pontiac.

Rambler Still Gaining

American Motors Corp. reports Rambler sales in the first ten days of May climbed 22.3 per cent over the same period in April.

Up to May 17, production was 38,075 units, compared with 38,299 during the same period last year.

Although George Romney, AMC president, recently denied that the corporation might discontinue production of its larger Nash and Hudson cars, some industry sources feel this move still may come.

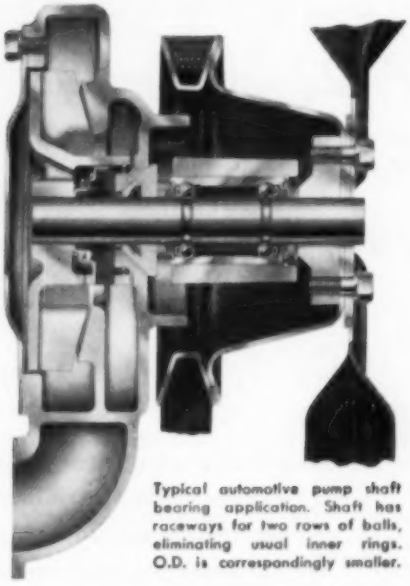
Production has been halted on all AMC cars but the Rambler.

FACTS

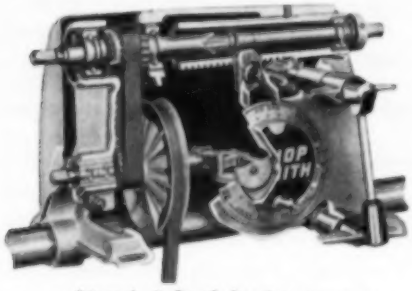
about

NEW DEPARTURE

BALL BEARINGS



Typical automotive pump shaft bearing application. Shaft has raceways for two rows of balls, eliminating usual inner rings. O.D. is correspondingly smaller.



Integral shaft of bearing serves as intermediate shaft in Magna's "Shopsmith". Assures fewer parts, easier machining, more accurate, quicker assembly.

For each McCulloch Mower, New Departure provides two pump shaft bearings with hollow shafts to permit vertical adjustments. Special heat treating gives full hardness at the raceways but adequate toughness in the shaft to withstand hard service.

FAN AND PUMP SHAFT BEARING IS ADAPTABLE TO MANY USES!

This sealed and "lubricated-for-life" bearing with integral shaft was originated by New Departure specifically to simplify automotive fan and water pump mounting. Since its inception, it has reduced bearing maintenance requirements to virtually zero in millions of car, truck and other engines.

Because of its unique design and ability to locate parts on its shaft against loads from any direction, designers find it a highly *versatile* bearing, adaptable to many other uses.

The manufacturer of a well-known power tool, which combines several tools in one compact unit, employs the pump shaft bearing as a complete intermediate shaft with pulleys on one end and a keyway for tool attachment on the other, with obvious design and performance advantages.

Another manufacturer produces a power mower in which two of these versatile NEW Departures with hollow shafts not only support the mower rotors, but permit vertical adjustment of the wheel spindles to regulate cutting height.

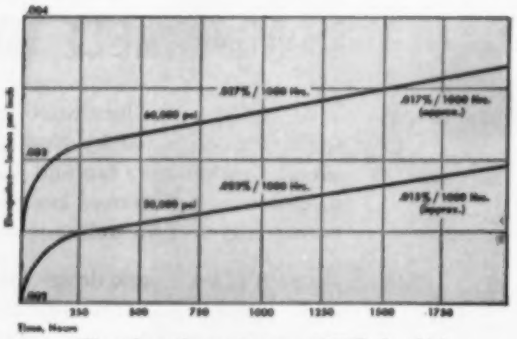
So here is another NEW Departure adaptable to many uses. New Departure engineers can show you what it and other ball bearings will do to improve your products.

FINE BALL BEARINGS MAKE GOOD MACHINES BETTER

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONN.

SAVE CRITICAL ALLOYS!

Get high turbine alloy performance with a low alloy steel—TIMKEN "17-22-A"(S) steel contains less than 3% alloy— gives maximum creep resistance to 1,000° F.



Time-elongation creep curves at 900°F. show high creep resistance of "17-22-A" (S)

You can save critical alloys by using the Timken Company's "17-22-A"(S) steel for gas turbine parts or other parts that operate at temperatures up to 1,000°F. With "17-22-A"(S) you get *high* alloy performance from a *low* alloy steel. It contains less than 3% alloy, yet it has maximum creep resistance up to 1,000° F. (The graph above shows its creep resistance at 900° F.)

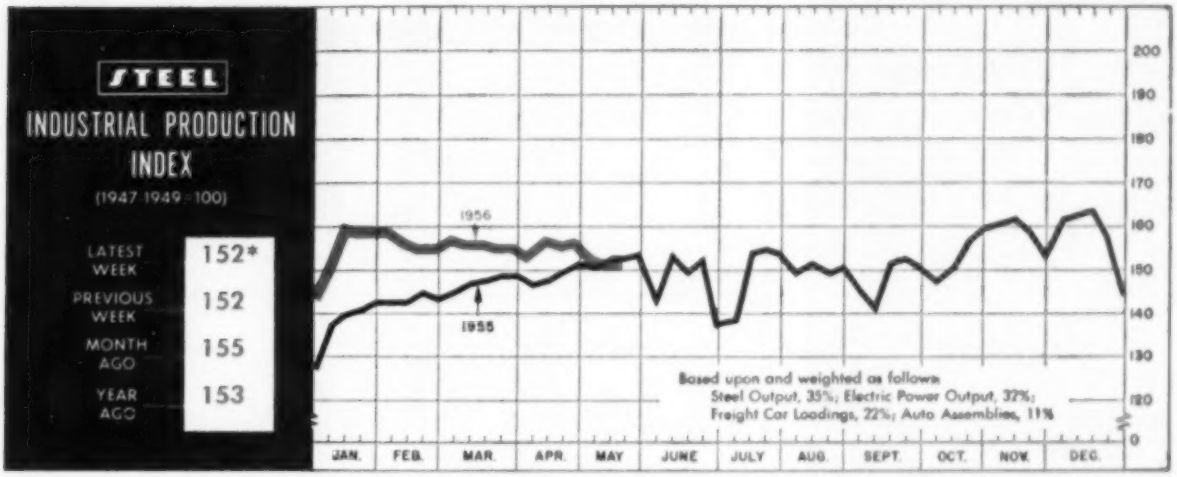
Proved in 13 years of service in refinery and steam power applications, "17-22-A"(S) resists heat checking and thermal cracking; is readily workable up to 2300° F.; is easily machined and welded. And with this steel, maximum high temperature properties can be developed by normalizing and tempering, minimizing the possibility of distortion and quench cracking. It's another steel developed by the Timken Company, acknowledged experts in high temperature steels.

For complete information on "17-22-A"(S) steel, and its companion analysis, "17-22-A"(V), recommended for temperatures up to 1100° F., write for Technical Bulletin No. 36A. And for help with your high temperature steel problems, call upon our technical staff. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

TIMKEN *Fine Alloy* STEEL

TRADE-MARK REG. U.S. PAT. OFF.

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING



*Week ended May 19

Economy Stays Balanced at High Level

THERE ARE so many crosscurrents operating within the economy that you can almost take your choice of predictions for the third and fourth quarters. It all depends on what you want to prove. But, by and large, the ups and downs tend to cancel out, leaving business in a precarious balance at a high level. It wouldn't take much to disturb that balance and send the economy up or down.

What makes it look so bad to some economists and businessmen is that we have ascended at such a rapid rate for a year or so that even a leveling out seems like a letdown. Business is at what one economist calls a "peaking out." The question is whether a "booster" will create another ascent or whether a real letdown will set in. The consensus at the annual meeting of the National Association of Purchasing Agents in Cleveland last week (see page 68) leaned toward the letdown. But there are convincing arguments to the contrary.

Main Forces—Forces for expansion are still strong. Private capital expenditures are heavy. Wages are rising, and even the work week is getting a little longer. It's hard to see how a recession can set in when relatively full employment is going on at 40 hours a week. This will keep consumer spending at high levels. Public expenditures are continuing heavy. Over-all, construction is heading for a new annual record in new work as well as repairs. Prices are on the upgrade — have been for several months and will continue that way for the rest of the year.

In addition, federal spending will be a strong sustaining factor. It will probably become greater as the year rolls on. Record backlogs in industry, coupled with a steady high level of new orders, will keep things on an even keel. And a point often overlooked is the strength shown by foreign economies, which is reflected in our own business picture.

Other Side — On the negative

BAROMETERS OF BUSINESS

	Latest Period*	Prior Week	Year Ago
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,379[1]	2,345	2,326
Electric Power Distributed (million kw-hr)	10,800[1]	10,837	9,730
Bituminous Coal Output (1000 tons)	10,055	10,160	8,737
Petroleum Production (daily avg—1000 bbl)	7,100[1]	7,029	6,676
Construction Volume (*ENR*—millions)	$300.2	$557.7	$475.7
Auto, Truck Output, U. S., Canada (*Ward's*)	141,957[1]	141,513	221,936
TRADE			
Freight Car Loadings (1000 cars)	770[1]	778	774
Business Failures (Dun & Bradstreet)	250[1]	258	226
Currency in Circulation (millions)[3]	$30,359	$30,296	$29,877
Dept. Store Sales (changes from year ago)[3]	+19%	−7%	+11%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$21,719	$20,658	$21,772
Federal Gross Debt (billions)	$275.7	$275.7	$277.3
Bond Volume, NYSE (millions)	$21.1	$22.3	$18.1
Stocks Sales, NYSE (thousands of shares)	11,148	12,855	10,690
Loans and Investments (billions)[4]	$84.9	$85.4	$81.2
U. S. Govt. Obligations Held (billions)[4]	$26.9	$27.4	$33.4
PRICES			
STEEL's Finished Steel Price Index[5]	210.45	210.45	194.53
STEEL's Nonferrous Metal Price Index[6]	276.9	277.0	237.1
All Commodities[7]	114.3	113.9	110.3
Commodities Other Than Farm & Foods[7]	121.8	121.8	115.7

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,441,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

DRILLS 7% MORE GRAY IRON VALVE BODIES PER SHIFT

...thanks to

FERROCARBO®

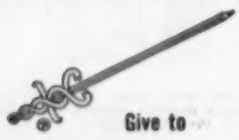
Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE...because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 51, Niagara Falls, N.Y.

CARBORUNDUM®

Don't sit back

STRIKE BACK!

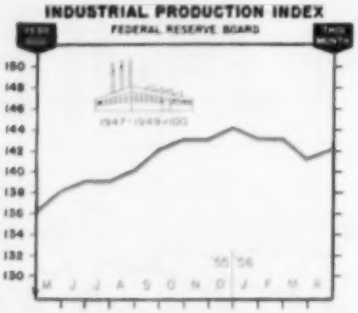


Give to

AMERICAN CANCER SOCIETY

THE BUSINESS TREND

INDUSTRIAL PRODUCTION INDEX
FEDERAL RESERVE BOARD

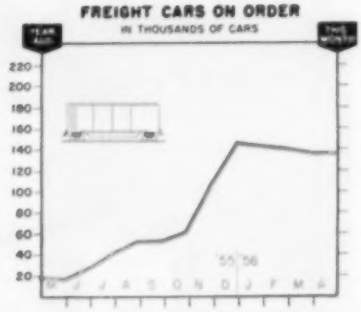


(seasonally adjusted)

	Total Production 1956	Total Production 1955	Primary Metals 1956	Primary Metals 1955	Metal Fabricating 1956	Metal Fabricating 1955
Jan.	143	132	148	127	170	157
Feb.	143	133	148	131	168	157
Mar.	141	135	145	136	167	160
Apr.	142*	136	147*	138	170*	160
May	...	138	...	140	...	162
June	...	139	...	143	...	163
July	...	139	...	134	...	167
Aug.	...	140	...	139	...	170
Sept.	...	142	...	146	...	171
Oct.	...	143	...	148	...	173
Nov.	...	143	...	149	...	172
Dec.	...	144	...	151	...	172
Avg.	...	138	...	140	...	165

Federal Reserve Board. *Preliminary
Charts copyrighted, 1956, STEEL

FREIGHT CARS ON ORDER
IN THOUSANDS OF CARS



	Awards 1956	Awards 1955	Backlogs (end of month) 1956	Backlogs (end of month) 1955
Jan.	1,818	5,087	144,946	18,395
Feb.	1,675	2,690	141,437	18,633
Mar.	1,618	2,156	137,070	17,974
Apr.	6,559	2,706	137,436	17,930
May	.....	3,041	.....	16,886
June	.....	13,365	.....	27,102
July	.....	18,097	.....	42,888
Aug.	.....	13,405	.....	52,803
Sept.	.....	3,228	.....	52,913
Oct.	.....	12,843	.....	61,954
Nov.	.....	51,066	.....	109,370
Dec.	.....	42,278	.....	147,320
Total	.....	169,872		

American Railway Car Institute

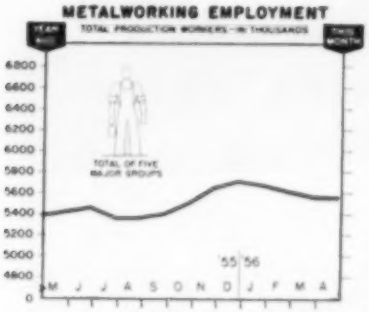
side, agriculture is in the doldrums, but even it is showing signs of a pickup. Heavy stocks of durables are a possible danger. Housing is soft, but it is picking up. James M. Dawson, vice president of the National City Bank of Cleveland, went on record at the NAPA meeting with a prediction of 1.2 million starts this year. Profit margins are shrinking in some industries, keeping them from expanding at the desired rate. Credit has tightened up some since the Federal Reserve Board's upward adjustment of the rediscount rate. There are reports that this is making it difficult to finance some expansion programs beyond 85 per cent of their value. However, this is expected to affect only marginal companies which might be poor risks anyway. Automotive production is down from the high point of last year. But the industry's new models are expected to provide a surge to business in the fourth quarter.

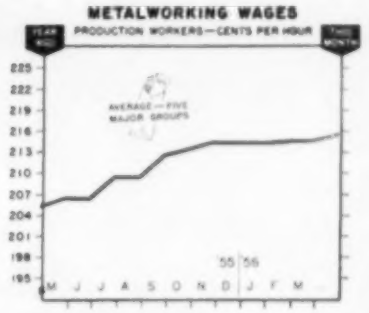
FRB Index Holds Steady

Looking at the strengths and weaknesses, the balance still comes out on the strong side. Strong evidence of this is the FRB's industrial production index (see chart above). It has fluctuated within a 3-point range since last September. While it may drop a bit this summer, especially if there is a steelworkers' strike, it could easily advance to about 145 (1947-1949=100) before the end of the year.

Carbuilding Backlog Up

The railroad industry is a good example of the confidence business is showing this year. Freight car orders rose sharply in April (see chart above). Even though deliveries also were strong, the backlog increased by 356 cars, says the Association of American Railroads. That's the first advance since the termination of fast write-offs on Dec. 31. There has been much pressure from Capitol Hill for the industry to expand. In addition, the number of freight cars over 50 years old is still mounting—they would form a train 130 miles long. Railroad spokesmen feel this is the time to buy—fast amortization or not. Revenues are up: Freight rates are higher; car loadings are rising; ton-miles are increasing. Outlook: Continued heavy ordering for the next few





1955	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Apr.	1,076	868	1,164	804	1,462
May	1,096	877	1,174	809	1,456
June	1,115	884	1,182	816	1,447
July	1,098	863	1,160	802	1,420
Aug.	1,112	877	1,155	818	1,379
Sept.	1,134	894	1,149	855	1,357
Oct.	1,135	904	1,194	885	1,378
Nov.	1,151	912	1,213	870	1,484
Dec.	1,160	908	1,236	872	1,511
1956					
Jan.	1,160	892	1,248	856	1,488
Feb.	1,158	879	1,260	851	1,431
Mar.*	1,158	872	1,266	843	1,399
Apr.*	1,159	869	1,269	861	1,381

*Preliminary
U. S. Bureau of Labor Statistics

1955	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
Apr.	217	195	206	186	220
May	218	196	207	187	222
June	220	196	208	187	219
July	228	199	208	188	223
Aug.	227	199	209	187	224
Sept.	233	201	211	189	226
Oct.	231	202	213	190	228
Nov.	231	202	214	191	231
Dec.	232	203	216	192	228
1956					
Jan.	233	203	217	192	224
Feb.	231	203	217	193	224
Mar.	232	203	217	194	224
Apr.*	231	203	218	195	226

*Preliminary
U. S. Bureau of Labor Statistics

months accompanied by swelling backlogs.

The roads are also busy ordering locomotives. There were 938 on order on May 1, the largest backlog since March, 1953.

Employment Remains Firm

Metalworking employment and wages remain at top levels, according to the U. S. Bureau of Labor Statistics (see charts above). As with the rest of the economy, crosscurrents canceled out each other. The totals will not change much until the summer months when vacations and possible strikes will reduce them. After that, a steady rise in employment and a sudden rise in wages are certain.

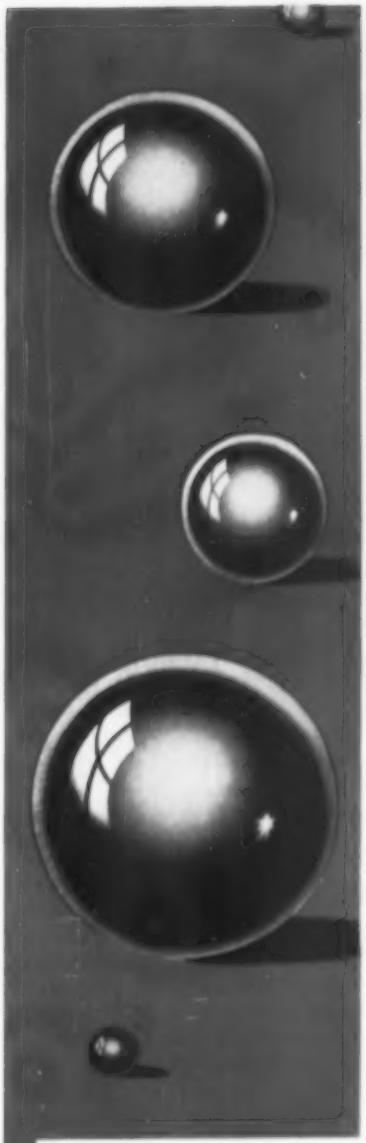
Electronics Outlook Good

The long-term outlook for the electronics industry is one of the brightest in our economy. By 1965, its volume should be 66 per cent greater than the $11 billion recorded last year, says Ernest B. Gorin, vice president of Radio Corp. of America. The television industry alone should more than double its revenues in that time, he says. Next year will be the kickoff for mass produced color sets, with sales of 700,000 units, building up to 5.2 million by 1960. Transistor sales will double each year for the next few years, according to Charles F. Adams Jr., president of Raytheon Mfg. Co. By 1960, all new portable and car radios will be transistorized.

Market Memos

• Credit restrictions will be eased by the Federal Reserve Board shortly. That's the consensus of industrial and financial leaders attending the semiannual meeting of Commerce Secretary Sinclair Weeks' business advisory council. The group feels that short-term funds are already tight, and that, if the situation spreads to long-term funds, industrial expansion will face cutbacks. The advisers see a slowdown in the third quarter but an upturn in fourth quarter.

• The Bureau of Labor Statistics' wholesale price index for all commodities for the week ended May 15 jumped from 113.9 to 114.3 (1947-1949 = 100), the sharpest increase since the week ended Mar. 29, 1955.


COOLIDGE
Balls
CHROME ALLOY AND STAINLESS
COOLIDGE CORPORATION
MIDDLETOWN, OHIO

Here's the man

to solve your roll problems

Ohio Rolls

Ohio Steel representatives show you how with

The Ohio Roll Representative who calls on you knows the metal industry, production processes and his products. He can tell you what you need to know about performance, life, hardness and relative strength of rolls. His recommendations are supported by technical data developed by Ohio's engineering, chemical and metallurgical departments. He knows rolls, and he knows that OHIO ROLLS give long, profitable service under critical operating conditions . . . because they are delivered only after exhaustive chemical and metallurgical tests and minute inspection.

When you need rolls—large or small—call in your Ohio Roll representative. He can help you solve your roll problems quickly and efficiently.

OHIO ROLLS SERVE THE WORLD

shaping metal for all industry

Carbon Steel Rolls • Ohioloy Rolls • Ohioloy "K" Rolls • Ohio Double-Pour Rolls
Chilled Iron Rolls • Denso Iron Rolls • Nickel Grain Rolls • Special Iron Rolls
Nioloy Rolls • Flintuff Rolls • Forged Steel Rolls

THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO Plants at Lima and Springfield, Ohio

one

DANIEL L. SHAKOTKO
. . . Dodge Div. purchasing agent

ARNOLD HUSAT
. . . Transue & Williams gen. supt.

LLOYD J. ELY
. . . Caterpillar Tractor dir.-mfg.

Daniel L. Shakotko was appointed purchasing agent, **Dodge Division,** Chrysler Corp., Detroit. He replaces **H. C. Cook,** who was reassigned to Chrysler's central purchasing department. Mr. Shakotko was with Chrysler as supervisor of productive material purchasing.

Raymond M. Hoak was made purchasing agent at **Toledo Stamping & Mfg. Co.,** Toledo, O. **Albert J. Ball** was made assistant purchasing agent. **Martin P. Higgins,** assistant chief engineer and acting chief engineer since last December, was promoted to chief engineer.

William M. Flint was elected president and general manager, **Olympic Steel Works,** Seattle. He succeeds **E. R. Hinton,** now chairman. Mr. Flint, for the last three years, served as vice president and works manager.

Mortimer S. Gordon was elected president, **Continental Copper & Steel Industries Inc.,** New York. He will continue to serve as chairman of the managing committee.

John W. Shingler was made chief tool engineer, **Pivot Punch & Die Corp.,** North Tonawanda, N. Y.

Bernard C. Dunn was made sales engineer, milling machines, for **Axelson Division,** U. S. Industries Inc., Los Angeles. He was with Diamond Machine Tool Co.

Arnold Husat was made general superintendent, forging division, **Transue & Williams Steel Forging Corp.,** Alliance, O. He succeeds the late **Emil Ramser.**

John P. O'Leary was named purchasing agent for **Westinghouse Electric Corp.'s** standard control division at Beaver, Pa. He succeeds **W. C. Meyer,** now purchasing agent for the East Pittsburgh divisions.

Standard Steel & Wire Corp., Chicago, appointed **Earl W. Snodgrass** manager of tool steel specialties division; **Richard C. Decker,** manager, tube division; and **Russell B. Phillips,** general line salesman.

Merle A. Hayward succeeds **Fred L. Schwab** as head of eastern division sales for **Phillips Control Corp.,** Joliet, Ill. Mr. Schwab was named general sales manager of the firm, which is a subsidiary of Thor Corp.

H. B. Schroeder was made production manager at **Roylyn Inc.,** Glendale, Calif.

L. E. Heasley fills the new post of general manufacturing superintendent of **Fafnir Bearing Co.,** New Britain, Conn. **Harcourt F. Schutz** succeeds Mr. Heasley as superintendent of the inspection division and **Howard L. Parsons** was made assistant superintendent.

Caterpillar Tractor Co., Peoria, Ill., elected **Lloyd J. Ely** director of manufacturing for its seven domestic plants. He is succeeded by **William L. Naumann** as manager of the Peoria plant. **Clifford N. Hathway** was made manager of the Joliet, Ill., plant.

Frederick H. Wadley was elected president of **Colorado Builders' Supply Co.,** Denver. He succeeds **James D. Maitland,** president since 1905, who was named chairman. **Charles K. Allison** was made vice president-general sales manager; **Roy R. Waugh,** general superintendent; and **Charles E. Berry,** manager of the equipment division.

L. J. Lieberthal was appointed general manager, **Conduit Fittings Corp.,** Chicago, division of U. S. Industries Inc. He succeeds **M. J. Weiss,** resigned.

Fullerton Steel & Wire Co., Chicago, appointed **Gordon Batley** product manager, steel mill products. He was vice president of W. R. Cox Steel Co.

Martin J. O'Brien Jr. was named manager-manufacturing engineering for **General Electric Co.'s** foundries in Everett, Mass., and Lynn, Mass. He was general manager, Atlas Foundry & Machine Co.

Dale L. Bennett was made superintendent, tool and machine manu-

J. L. HUMPHREY
. . . Bethlehem Pacific sales appointment

GLEN J. HARTMAN
. . . Ohio Seamless Tube operations mgr.

DOUGLAS SWANSON
. . . Swanson Tool & Machine v. p.

facturing division, **Acme Steel Co.**, Chicago.

J. L. Humphrey, mill engineer for the last three years at the Seattle plant of **Bethlehem Pacific Coast Steel Corp.**, was appointed manager of industrial fastener sales. He will be at Bethlehem's general offices, San Francisco.

Ernest L. Richmond was made chief engineer for **Worthington Corp.'s** Plainfield, N. J., division.

Fansteel Metallurgical Corp., North Chicago, Ill., elected as vice presidents **Dr. Leonard F. Yntema**, director of research; **Dr. John D. Kleis**, manager of the electrical contact division; and **Stuart B. Miller**, comptroller.

Thomas J. Watson Jr., president of **International Business Machines Corp.**, New York, was elected chief executive officer. **Thomas J. Watson Sr.** will continue as chairman.

Albert B. Willi Jr. was promoted to executive engineer, **Federal-Mogul Division**, Federal-Mogul-Bower Bearings Inc., Detroit. He was assistant chief engineer in charge of sales engineering. He continues to direct these activities in addition to supervising service and product engineering under the direction of the chief engineer.

J. Earl Romer was made manager of eastern sales of **Bliss & Laughlin Inc.** at Buffalo.

Glen J. Hartman was made manager of operations, **Ohio Seamless Tube Division**, Copperweld Steel Co., Shelby, O.

Hubert F. Green was made general sales manager, **Speedways Conveyors Inc.**, Buffalo.

Edward P. Gillane, president of **Potter & Johnston Co.**, Pawtucket, R. I., was elected executive vice president of **Pratt & Whitney Co. Inc.**, West Hartford, Conn., subsidiary of Penn-Texas Corp. **J. Potter Cunningham**, vice president-sales manager of Potter & Johnston, a P&W subsidiary, becomes its president to succeed Mr. Gillane.

Douglas Swanson was named manager of sales engineering and vice president of **Swanson Tool & Machine Products Inc.**, Erie, Pa. He was sales engineer.

Fred Ullberg Jr. was elected vice president-sales, **T. J. Cope Inc.**, Collegeville, Pa. He succeeds **James G. Thomas** who resigned as general sales manager. **Emil Marcmann**, works manager, assumes the additional post of chief engineer formerly held by Mr. Ullberg.

Easton Car & Construction Co., Easton, Pa., appointed **George Sines** chief engineer. He was pre-

EDWARD P. GILLANE

J. POTTER CUNNINGHAM
. . . Pratt & Whitney, Potter & Johnston executives

CONTROLLED PRESSURE AT 100,000 PSI!

Superior super pressure quality tubing has been used to handle internal pressures from 15,000 to 100,000 psi—offers high fatigue strength, chemical resistance and burst pressure to spare

In *any* industry, handling liquids and gases safely and efficiently under extremely high pressures can be done best by using only top-quality tubing. And Superior *specializes* in premium quality super-pressure tubing.

Superior produces this tubing from specially selected raw materials which have had the inside surfaces conditioned to remove fissures and other defects. In processing, special degreasing operations are performed on the tubing, and the inside diameters are sand blasted to insure a clear, smooth surface.

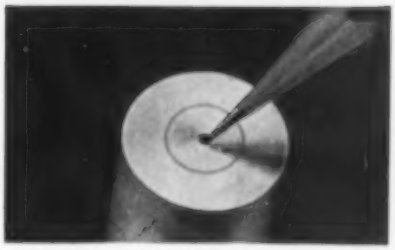
Two types of Superior super pressure tubing are available: a single wall mechanical tubing and a double wall, or composite unit, made from two thinner tubes.

Super pressure tubing is produced in an annealed condition and in ⅛ hard temper, and to mechanical properties specified by the customer.

This tubing is offered in the austenitic stainless steels, Types 304, 316, 321 and 347 and in AISI 4130 alloy steel. It is produced in sizes ⅛" OD x ⅛" ID up to ¾" OD x ⅛" ID. Minimum order quantity for mill production is 50 ft. per size and analysis.

Superior rigidly inspects all super pressure tubing for defects such as fissures by visual and microscopic inspection methods. Each length is hydrostatically tested to 5000 psi—upon request, up to 60,000 psi.

If you have a tubing problem in high pressure processing—or of any other nature—call on Superior. Write Superior Tube Company, 2005 Germantown Ave., Norristown, Pa., for Data Memorandum 22.



The composite type stainless super pressure tubing offers the advantage of having the inner and outer tubes independently worked to mechanical property requirements and of different alloys being combined for strength and corrosion resistance.

SUPER PRESSURE TUBING MINIMUM BURSTING PRESSURES FOR AUSTENITIC STAINLESS STEELS AND 4130 ALLOY STEELS

	MAXIMUM WALL			
OD	.053	.095	.156	.218
⅛	*97,200 84,400			
¼	*40,200 34,800	82,000 71,000		
½	*17,400 15,000	33,500 29,100	62,500 54,000	
¾	*13,600 11,800	25,000 21,600	47,600 40,300	72,600 63,000

*Top figures all Austenitic Stainless Steels
Bottom figures all 4130 Alloy Steels

Superior Tube

The big name in small tubing

NORRISTOWN, PA.

All analyses .010" to ⅜" OD—certain analyses in light walls up to 2½" OD

West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. • RAymond 3-1331

L. S. MOBLEY
. . . Republic's Gadsden, Ala., chief eng.

W. E. TROMANHAUSER
. . . Pyrene-C-O-Two vice president

SWAN E. BERGSTROM
. . . Cincinnati Milling exec. v. p.

viously assistant vice president at Lakeshore Engineering Co.

L. S. Mobley succeeds **Roy E. Brakeman,** retired, as chief engineer of the southern steel district of **Republic Steel Corp.** at Gadsden, Ala. He transferred to Gadsden from Republic's Warren, O., plant in January, 1955, and was made assistant chief engineer last October. Mr. Brakeman continues to serve as a consulting engineer.

Dr. Charles R. Burrows, director of Cornell University's School of Electrical Engineering, will join **Ford Instrument Co.,** division of Sperry Rand Corp., effective July 1. Dr. Burrows will become vice president-engineering.

James R. Erven was named vice president and sales manager, **Kennedy Valve Mfg. Co.,** Elmira, N. Y.

William J. Lawless was appointed manager of tubular sales, **Hill-Chase & Co. Inc.,** Philadelphia. He was assistant manager, order department.

W. E. Tromanhauser was made vice president and general sales manager, **Pyrene - C - O - Two Division,** Newark, N. J. He was president of Buffalo Fire Appliance Corp.

Gamewell Co., Newton Upper Falls, Mass., appointed **Edward S. Ruth** chief engineer. He succeeds **Frank R. Bridges,** resigned.

Jordan Refrigerator Co. Inc., Philadelphia, subsidiary, United States Air Conditioning Corp., elected **Col. William Moiselle** vice president and general manager; **John A. Cochrane,** vice president-manufacturing; and **B. W. Goodman,** sales director, domestic products.

W. J. Reed was made Cleveland district manager, **Alloy Metal Wire Division,** H. K. Porter Company Inc. He replaces **Peter Stefan,** recently promoted to general sales manager.

James A. Munro was made manager, structural fabricating division, **Joseph T. Ryerson & Son Inc.,** Chicago. He succeeds **Lambert J. Bodeewes,** who was made structural fabricating consultant.

Swan E. Bergstrom was named executive vice president, **Cincinnati Milling Machine Co.,** Cincinnati. He succeeds **Walter W. Tangeman** who was elected chairman. Mr. Bergstrom joined the company in 1927. He became vice president in 1949 and manager, machine tool division, in 1954.

Fritz Bingaman was elected president of **Gremco Inc.,** Ft. Worth, Tex.

Roger M. McCray was made product sales manager, **Kennametal Inc.,** Latrobe, Pa. He was a sales representative in the Buffalo area.

Alfred A. Augustine was named chief engineer, **Loftus Engineering Corp.,** Pittsburgh.

Joseph F. Sullivan Jr. was named plant manager of **Utilex Mfg. Co.,** Fowlerville, Mich., a subsidiary of Universal Die Casting & Mfg. Corp.

John D. Goodall was appointed assistant to the president of **Northwestern Steel & Wire Co.,** Sterling, Ill. He was works manager of Pheoll Mfg. Co.

OBITUARIES . . .

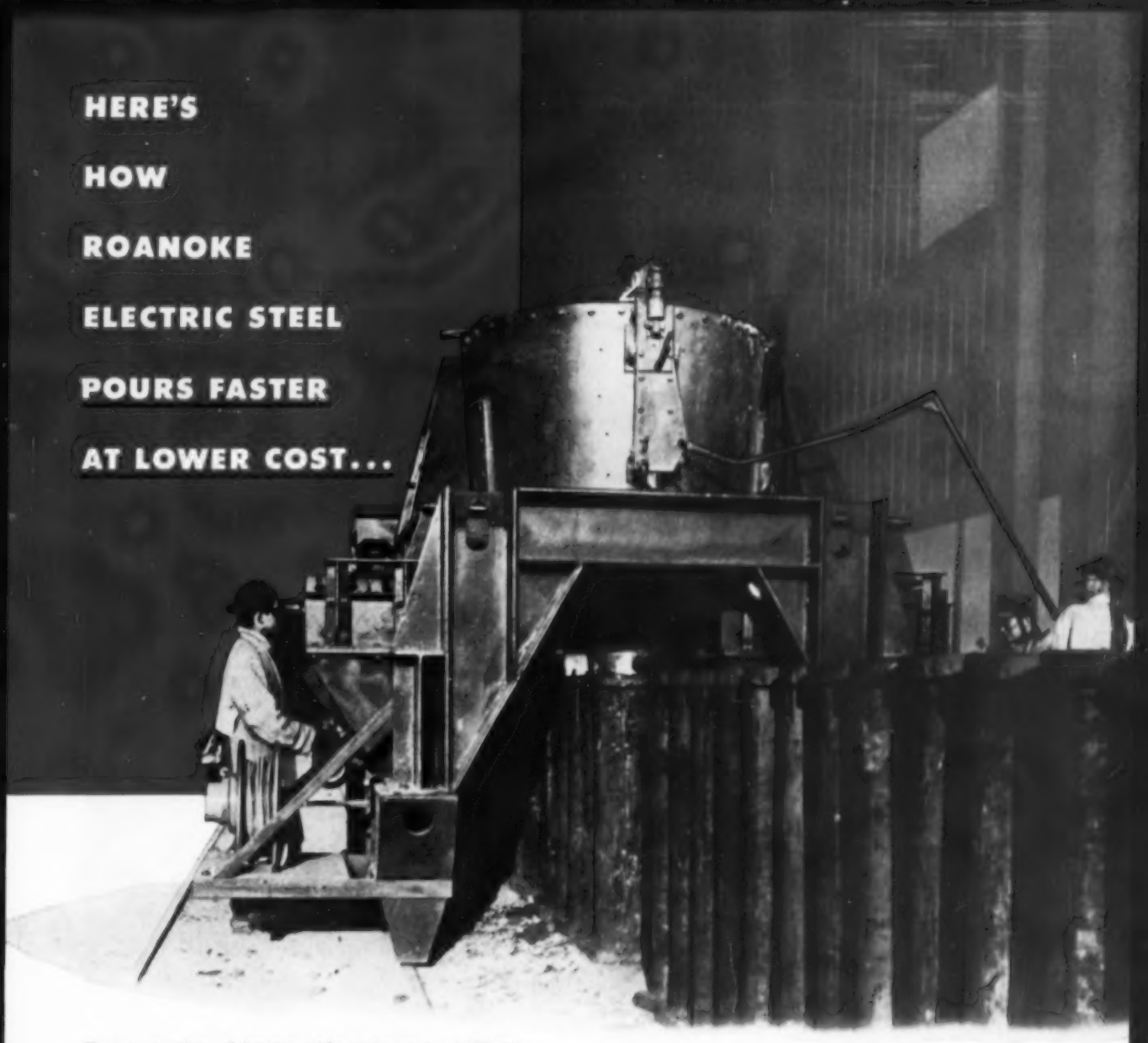
John Bottorf, purchasing agent for **American Brake Shoe Co.,** Tonawanda, N. Y., died May 9.

Crane Co., Chicago, officials killed May 15 in an airplane crash, were: **J. A. McMurry,** director of branches; **J. A. Dwyer,** vice president-industrial sales; **G. L. Erwin Jr.,** vice president - heating sales; **G. G. Lindholm,** manager, valve and fitting department; **F. J. Wilkey,** special representative, industrial sales, and **C. C. Towner,** assistant to the vice president-heating sales.

Martin E. Arden, secretary, **National Steel Corp.,** Pittsburgh, died May 13.

Emil F. Miller, 58, sales manager, **Advance Tool & Die Casting Co.,** Milwaukee, died May 9.

HERE'S HOW ROANOKE ELECTRIC STEEL POURS FASTER AT LOWER COST...



Faster pouring of ingot molds at lower cost! That's what a Whiting special ladle transfer car is doing at the Roanoke Electric Steel Corporation plant at Roanoke, Virginia.

Two rows of ingot molds are set up on the floor. The transfer car on tracks with the large Whiting ladle is electrically operated to pass back and forth over the molds. The ladle is mounted in standards with filler blocks to position it at two elevations and thus accommodate two mold heights. The standards are mounted on roller conveyors with a manually operated racking device for lateral positioning to either of the two rows of molds. One operator directs the pouring spout and another man on the opposite side of the car controls the flow of the metal affording a coordinated operation that is fast and efficient. Not only does this installation speed pouring, but it reduces pouring costs as well.

In addition to special ladles such as the Roanoke ladle transfer car, Whiting Corporation manufactures a large variety of standard ladles completely illustrated in the Whiting Ladle Catalog.

WHITING CORPORATION
15643 Lathrop Avenue, Harvey, Illinois

Write for your free copy today!

WHITING
LADLE CARS

Dramatic 5 minute heat test

proves "3M" Safety Fabric superiority!

BRAND

5 Minute Test
Here is PROOF! Now one helper works in front of the door during slag-off operations without relief! New "3M" safety fabric reflects heat, doesn't absorb it. Takes up to 3000°F. without flinching!

See a demonstration yourself of the new "3M" safety fabric in garments that help you cut production downtime as much as 75%!

Watch the protective efficiency of this amazing new material in the slag-off operation! See it shed molten spatter and splash! See the free and easy movement of the helper, as he works in this lightweight gear. Then ask him if he'll want to wear it again. He'll say "Yes" . . . because this is the safety equipment men *like* to wear.

New "3M" safety fabric reflects *90% of radiated heat*. This new discovery means longer life for safety garments, too, from 30 to 50%. And there is a complete line of equipment available . . . gloves, aprons, coats, helmets, etc.

Why not make a date to see it now. Return the coupon below for full details and a personal demonstration of this new safety clothing that lets you cut production downtime up to 75%, repair furnaces without shutdown and many other vital money-saving jobs around your mill.

3M Brand Aluminized Fabric Garments are available from leading manufacturers

SPECIAL DEMONSTRATION OFFER!

3M BRAND

Aluminized Fabric

3M COMPANY

The term "3M" is a registered trademark of Minnesota Mining & Mfg. Co., St. Paul 6, Minn. General Export: 99 Park Avenue, New York 16, N. Y. In Canada: P.O. Box 757, London, Ontario

Minnesota Mining & Manufacturing Co.
Dept. KD-56, St. Paul 6, Minn.

Please send complete details and arrange for my personal demonstration of new, money-saving, burn-stopping "3M" safety fabric clothing.

Name_____

Company_____

Address_____

City_____ Zone_____ State_____

Firm Buys Furnace

Republic's continuous carbon correction annealing unit will have monthly capacity of 1000 tons

REPUBLIC Steel Corp.'s Union Drawn Steel Division will install a continuous carbon correction annealing furnace at its Massillon, O., plant. In one continuous operation it anneals steel bars and restores carbon burned out by previous hot-working operations.

No. 3—This will be the third such furnace to be installed by the division. The first was put into operation at Massillon in 1951. The other was installed at the firm's Gary, Ind., plant in 1954. The design is to specifications drawn by Union Drawn's chief metallurgist, J. D. Armour.

The division also operates carbon correction annealing furnaces of the car type at Massillon and Gary and a continuous carbon correction coil annealing furnace at Massillon.

The new furnace at Massillon will have a capacity of about 1000 tons a month. It is expected to be in operation early in 1957.

Saves Steel — Decarburization was a problem with previous annealing methods. It made bar surfaces too soft for use in many industries, necessitating the removal of these low carbon areas by machining or grinding.

Atmospheric conditioning units now carry gases containing carbon to the annealing furnace. They prevent surface decarburization during annealing. Carbon lost during previous heat treating operations is restored by carbon in the gases.

Bars so produced are used widely in the farm equipment, automotive, machine tool, hardware and household appliance industries.

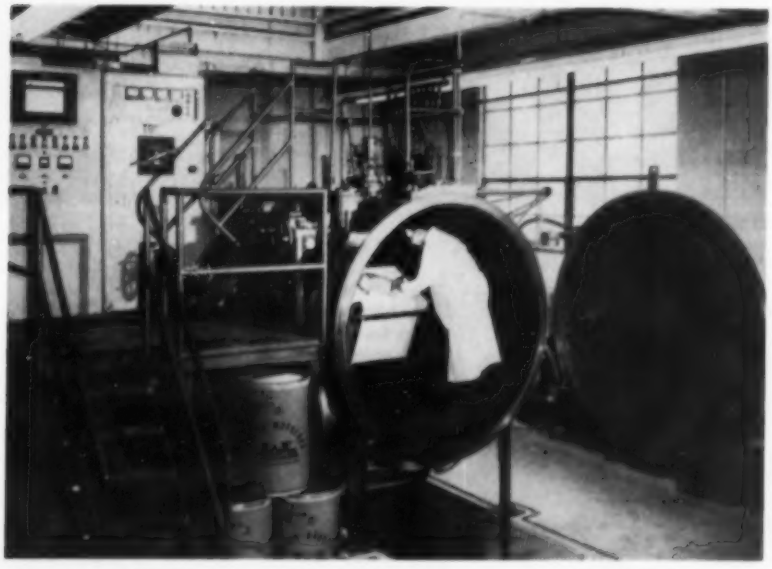
Ohio Steel Foundry To Build

Ohio Steel Foundry Co., Lima, O., plans construction of an office building and a machine shop building at its Springfield, O., plant.

Eastern Stainless Expands

Eastern Stainless Steel Corp., Baltimore, will allot proposed new financing this way: Some $2 million for additional melting facilities, $500,000 for building construction at its Baltimore mills, $750,000 for a 30-ton electric arc furnace and equipment, $400,000 for

(Please turn to page 96)



Vacuum Melting Installed by Cannon-Muskegon Corp.

Iron, nickel and cobalt-base alloys are melted in 300-lb heats in about 3 hours in Cannon-Muskegon's vacuum-melting furnace, which develops 3000°F and operates at less than 10 microns of pressure. It is used for development work on vacuum castings, makes cast bars for remelting and produces cast ingots and billets up to about 250 lb for rolling, forging, extruding or machining

Precision cold drawing tubing is a science with TMI. It is a combination of trained brain power and production facilities developed to match the design demands of alert manufacturers. From guided missiles to business machines, atomic jets to fountain pens . . . the results are the same. Better tubing by TMI pays a big part in building a better future.

STAINLESS STEEL AND SPECIAL ALLOY TUBING

—in small diameters, .050" to .625" O.D. with tolerances as close as .001" when required.

This is the Trade Mark You Can Trust for Delivery When and As Promised.

TUBE METHODS INC.

METALLURGISTS • ENGINEERS • MANUFACTURERS

BRIDGEPORT (Montgomery County), PA.

BLAW-KNOX

makes what it takes

to hot roll high-tonnage

top quality sheet

This CONTINENTAL 80-inch, 6-stand continuous hot strip mill in the United States Steel's Gary Sheet and Tin Mill was designed and engineered for heavy duty and high-speed finishing. It is well-known throughout the industry for excellent tonnage performance and quality.

In addition to these large mills, Blaw-Knox builds single-stand reversing hot strip finishing mills, complete with all auxiliaries.

Blaw-Knox designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

BLAW-KNOX COMPANY
Foundry & Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Complete rolling mill installations . . . including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment

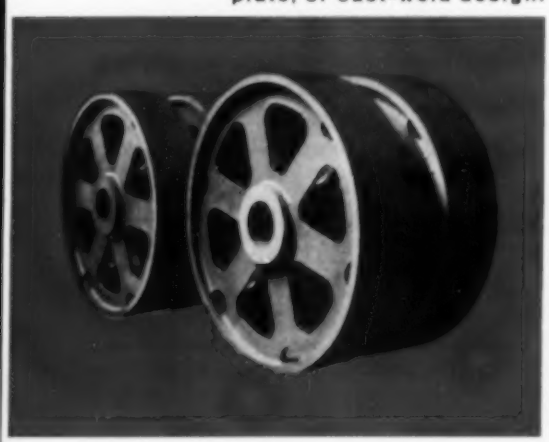
50th Anniversary
BLAW-KNOX
1906-1956

CONTINENTAL

ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.

CONTINENTAL 80-inch continuous hot strip mill in the Gary Sheet and Tin Mill of the United States Steel Corporation.

WELDMENTS—fabricated steel plate, or cast-weld design.



CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.

BOLTS
NUTS
SCREWS

take your choice . . . of America's largest warehouse stocks of bolts nuts screws

Everything For Fastening

One-stop fastening service—everything—bolts, nuts, screws, rivets, washers—at one time, one place, with one order. That's how you get real buying economy.

Call Sterling Bolt—or any of our distributors.

See You At The Materials Handling Institute Exposition; Our Booth— # 701

STERLING BOLT COMPANY

383 West Erie St., Chicago 10, Ill. - Phone: Superior 7-3000, Teletype: CG 488

MANUFACTURING PLANTS IN / CHICAGO • ST. LOUIS MILWAUKEE

Available at these and other **distributors**

EAST COAST BOLT AND NUT CO. 84-94 HUDSON ST., NEW YORK 13, N.Y.

PAN-PACIFIC SCREW AND BOLT CO. 201 NEVIN AVE., RICHMOND, CAL.

GULF COAST BOLT AND NUT CO. 1115 SILVER ST., HOUSTON 10, TEX.

TEXOKANA BOLT AND NUT CO. 1810 S. AKARD ST., DALLAS 1, TEX.

PENN BOLT AND NUT CO. P.O. BOX 9987, PITTSBURGH 33, PA.

(*Concluded from page* 93)

cranes and handling equipment, $350,000 for supporting items.

Youngstown Firm Expands

Youngstown Steel Door Co., Youngstown, has begun a $750,000 expansion to relieve overcrowded conditions brought about by increased railroad car orders. The project includes a factory building and an office addition.

Truscon To Boost Lath Output

Republic Steel Corp.'s Truscon Steel Division has launched a modernization program which will double its metal lath producing capacity. Included will be a change in the manufacture of metal lath and accessory products. They will be made from coil stock instead of from sheets.

Murray Enlarges Salem Plant

Murray Corp. of America announced a $2.5-million expansion of production facilities at its Eljer Division plant at Salem, O. A plant addition of 130,000 sq ft will be built. The division produces vitreous china and steel plumbing fixtures and brass fittings.

Chicago Pneumatic Buys Firm

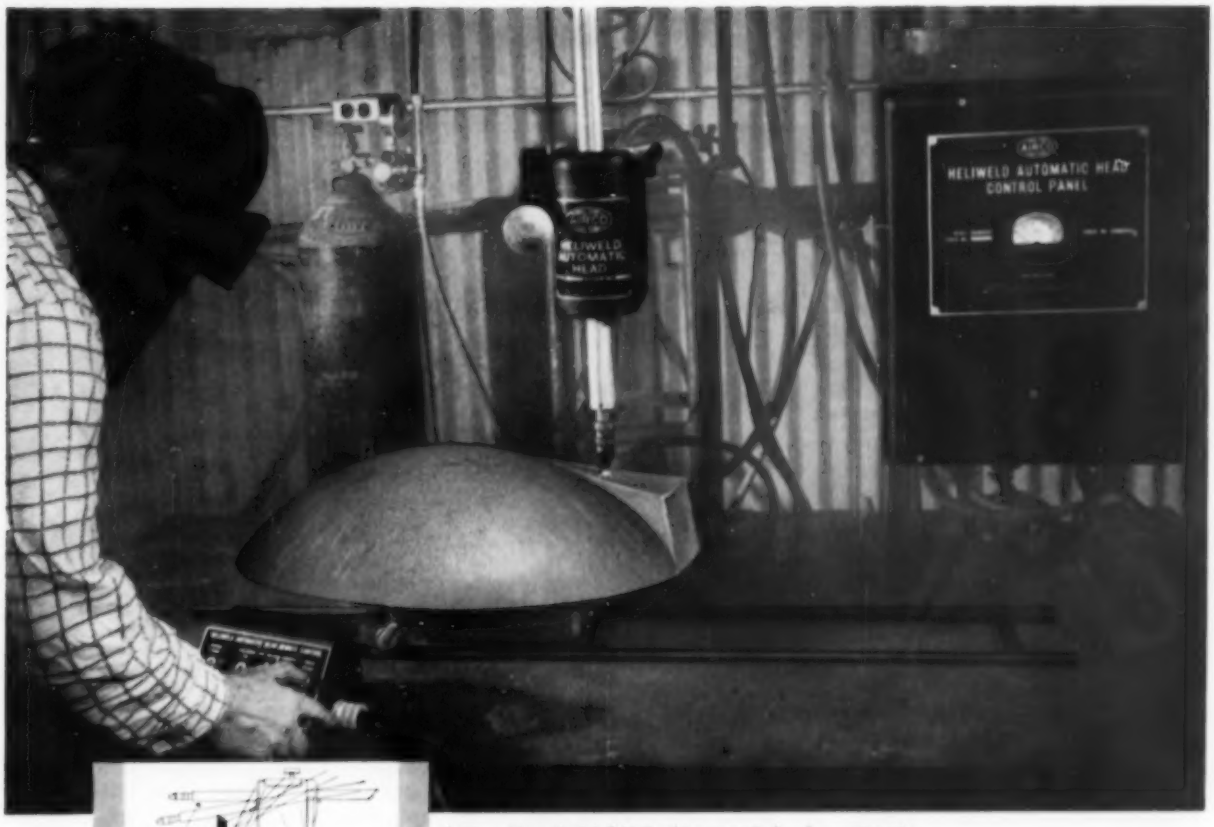
Chicago Pneumatic Tool Co., New York, purchased Allen Mfg. Co., Hartford, Conn., manufacturer of hex socket setscrews, capscrews and related products.

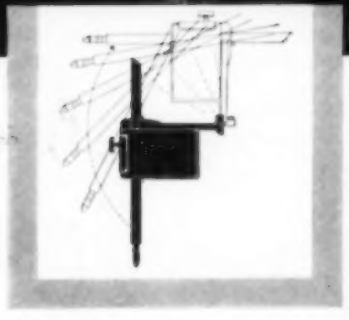
Sterling Die To Build

Sterling Die Division, Pratt & Whitney Co. Inc., West Hartford, Conn., will erect a factory in Southwest Industrial Park, Cleveland. It will more than treble the division's manufacturing facilities and will be ready for occupancy Oct. 1.

C&O To Enlarge Raceland Shops

The Chesapeake & Ohio Railway has appropriated $1.5 million for expansion of facilities for fabricating freight cars at its Raceland, Ky., shops. This is in addition to the $500,000 approved last February for the same purpose. A new reclamation building will be erect-





New Airco Model C Heliweld automatic head operates at all angles from horizontal to vertical.

Airco introduces New Automatic Heliweld Head for long-run production welding

The Model C Heliweld automatic head is specifically designed for long-run production on regular or irregular contours – aluminum tubing, motor stators, irregularly-shaped pressure vessels. Its prime advantage is that once the required arc length is set the head will automatically maintain this distance by moving the holder up or down to follow the contours of the work piece. Other benefits are:

- **Versatility** – unit provides good arc voltage control using either argon or helium shielding gases or mixture of both.
- **Adaptability** –the head can be operated at all angles from the horizontal to the vertical (normal) position. The maximum raise-lower distance of the electrode holder is a full 16".
- **Flexibility** – the assembly can be used for AC or DC welding, with or without filler wire. Electrode diameters range from .020 to ⅛".

The use of the new automatic head will be required where welds of consistent dimensions and quality are important and where good weld appearance is necessary or where welding specifications are very high for the electrical, aircraft, and refrigeration industries. Complete information covering the wide range of applications and detailed specification data is available. Write Airco at the first opportunity.

AT THE FRONTIERS OF welding PROGRESS YOU'LL FIND . . .

AIRCO®

Offices in most principal cities

AIR REDUCTION SALES COMPANY

A division of Air Reduction Company, Incorporated, New York 17, N. Y.

On the west coast – Air Reduction Pacific Company

Internationally – Airco Company International

In Cuba – Cuban Air Products Corporation

In Canada – Air Reduction Canada Limited

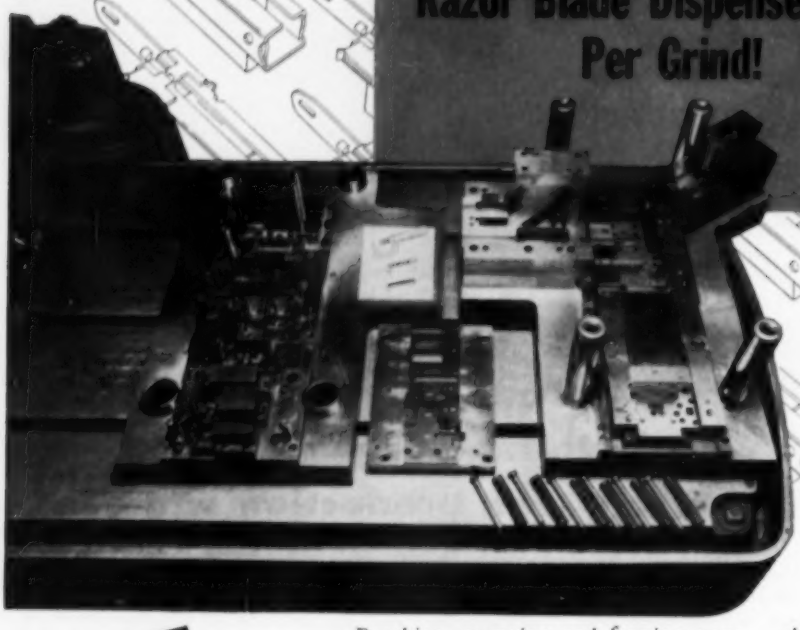
Products of the divisions of Air Reduction Company, Incorporated, include: AIRCO – industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** – carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** – medical gases and hospital equipment • **NATIONAL CARBIDE** – pipeline acetylene and calcium carbide • **COLTON** – polyvinyl acetates, alcohols, and other synthetic resins.

LUDLUM DIE STEELS

PUNCH, STAMP, FORM

2 MILLION

Razor Blade Dispenser Parts Per Grind!

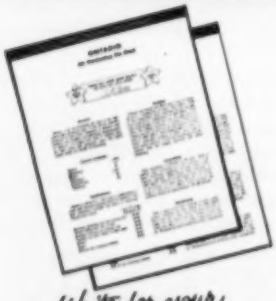


Punching, stamping and forming parts of this die are of air-hardening Ludlum ONTARIO—heat treated to 61-62 Rockwell C. Slides, frames and cams are of Ludlum DEWARD oil-hardening die steel—heat treated to 61-62 Rockwell C.

Ontario sections were pre-heated to 1250 F, then heated to 1850 F, held at 1850 F for about an hour and a half, then quenched in still air to room temperature. Finally they were drawn at 350 F for about three hours.

Deward sections (slides, frames and cams), were pre-heated to about 1200 F, then raised to 1420 F. As soon as they were uniformly heated and equalized with the furnace temperature, they were quenched in warm oil. Sections were then tempered for two hours at 325 F.

Thus, two superior Ludlum steels combine to solve an intricate production problem. You, too, may have an application that will benefit from a better selection of tool or die steels. For complete information, call your nearest A-L distributor or representative today, or write ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh, Pennsylvania.***



Write for your

DEWARD & ONTARIO BLUE SHEETS

These 4-page folders contain complete information on forging, annealing, tempering, etc., and detailed laboratory data on physical characteristics of Ludlum Deward and Ontario. *Ask for your free copy.*

Address Dept. S-771

For complete **MODERN** Tooling, call

Allegheny Ludlum

WAD 5351

AL® FINE TOOL STEELS SINCE 1854

ed for housing new machinery needed in car manufacture, and an extension will be built to its wheel shop.

Titanium Plant Opens

Columbia - Southern Chemical Corp., Pittsburgh, has placed in operation its titanium tetrachloride plant at Natrium, W. Va. Annual production capacity is 35,000 tons.

Canadian Wiremaker Expanding

Phillips Electric Co. Ltd., manufacturer of cable and wire, plans a $7.5-million expansion of its plant at Brockville, Ont.

Harris-Seybold Buys Firm

Harris-Seybold Co., Cleveland, manufacturer of printing equipment, purchased the electronics firm of Airtronic Research Inc., Bethesda, Md.

Automatic Switch Builds

Automatic Switch Co., Chicago, is building a plant at Florham Park, N. J., which will have double the capacity of the firm's plant in Orange, N. J. The company makes solenoid valves and electromagnetic controls.

NEW ADDRESSES

Fairbanks, Morse & Co., Chicago, moved its Electronics Division from Davenport, Iowa, to 1109 14th Ave., East Moline, Ill.

Loma Machine Mfg. Co. Inc. moved its offices to larger quarters at 114 E. 32nd St., New York 16, N. Y.

G. O. Carlson Inc., stainless steel distributor, moved its Buffalo district sales office to 3491 Delaware Ave., Tonawanda, N. Y.

Southern Engineering Co., manufacturer and jobber of steel products, has a new mailing address: P.O. Box 10588, Charlotte 1, N. C.

Clemco Aero Products Inc. moved into a plant at 210 E. Man-

(*Please turn to page* 102)

CM Lodestar

ENTIRELY NEW
differently NEW

FEATURING:

- Push Button Control
- Ultra-Modern Regenerative Electric Braking
- Self-Adjusting Heavy Duty Magnetic Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Fully Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ⅛ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

$149.50 and up
F.O.B. Factory

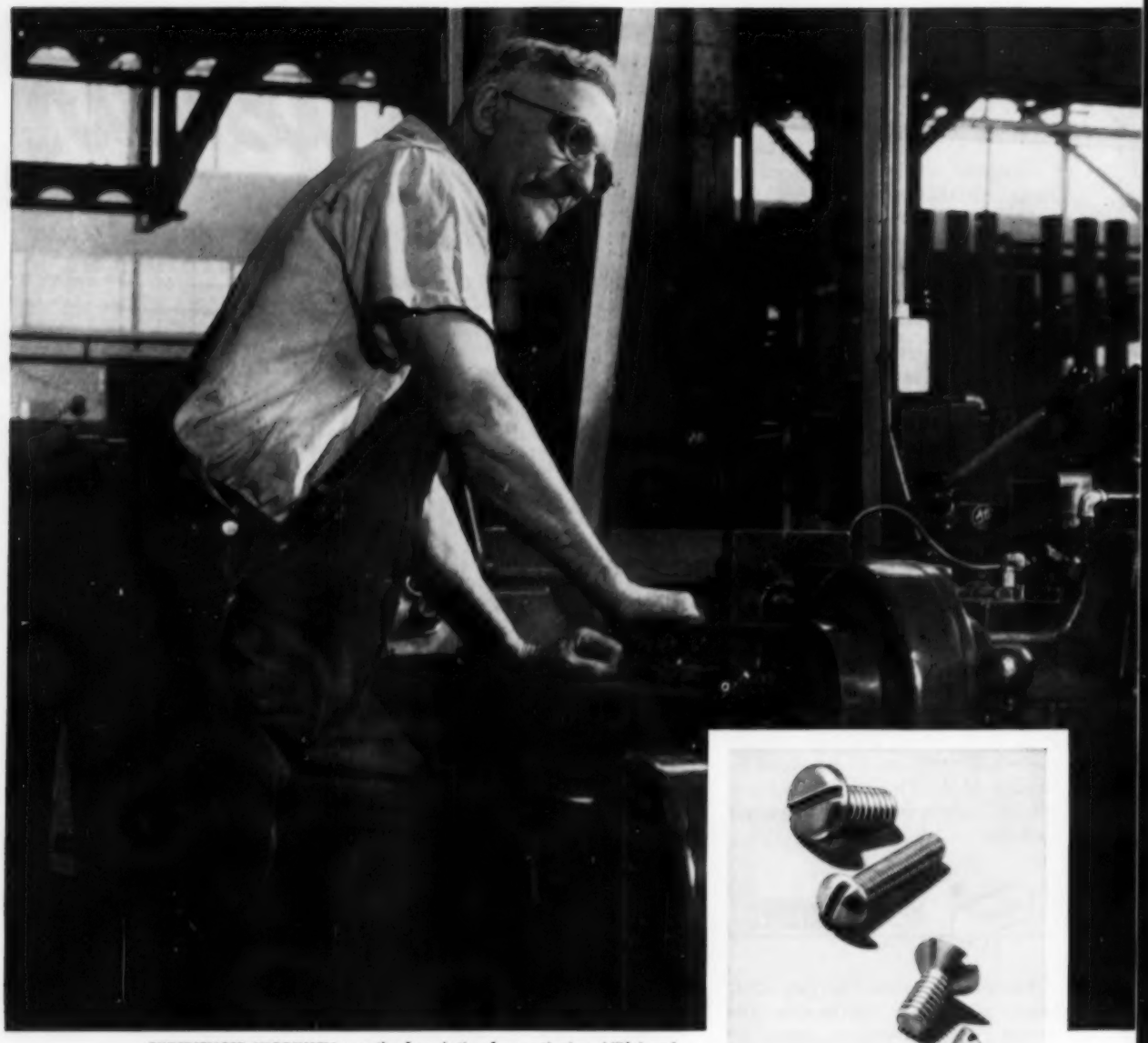
Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Chain Corporation
Tonawanda, New York
REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM HOISTS AND CHAIN



EXPERIENCED WORKMEN are the foundation for continuing skillful and efficient production. At our Bolt and Chain Division, even the most modern equipment is constantly checked by seasoned operators to be sure of uniform top quality in each fastener, regardless of type or size.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

The case for FASTENER SELECTION

A century of experience underwrites fastener reliability

What puts the "know" in "know-how"?

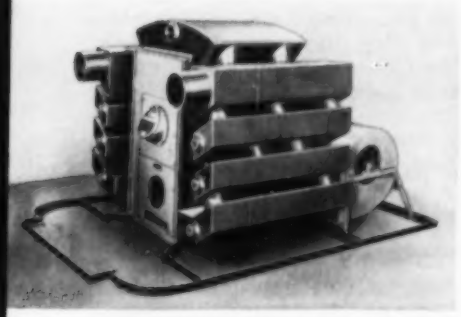
The answer is experience . . . a major factor in spelling the difference between ordinary and top-quality fasteners.

Almost any manufacturer can take a metal bar, upset a head on it, thread the other end and call it a bolt. And it's equally easy to take a small length of square or hex stock, drill it, tap it and call it a nut. But the results, in either case, are far from satisfactory from a production line standpoint.

To satisfy modern industry's demands for practical, uniform, dependable fasteners for every application, it takes the best materials, the best machinery and the best methods. And you get all of these elements when you specify Republic Bolts and Nuts.

Republic's Bolt and Chain Division is backed by 101 years of experience in manufacturing fine fasteners. As a result, we know the proper analysis of steel for any given application—we know *why* it is best—and we make it to exact specifications in our own mills. This same experience has guided us in establishing the world's finest facilities and methods to assure you uniform high quality in each fastener, in any quantity, every time.

So back your assemblies with the quality fasteners they deserve. Don't just order bolts and nuts . . . *select* Republic and be sure of the best. You can choose from 20,000 standard types and sizes plus 8,000 specials. Mail the coupon today for complete information.



EXPERIENCE MEANS QUALITY in Republic ELECTRUNITE® Mechanical Tubing. That's why The Bard Manufacturing Company, builders of this year-round furnace and air-conditioning unit, says, "ELECTRUNITE Tubing enables us to secure safe, tight gas joints required by our down-flow construction." Republic's Steel and Tubes Division has over 50 years' experience in producing welded tubing suitable for the most exacting requirements.

EXPERIENCE MEANS EFFICIENCY in materials handling equipment. As a major producer of corrugated steel boxes, skids and pallets, our Pressed Steel Division offers all types and sizes to meet normal requirements. And, where you have unusual problems, like the handling of loose tubular parts shown above, we can produce special types to provide years of economical service. Send coupon for details.

EXPERIENCE PROVES DURABILITY of Republic Galvannealed Sheets in outdoor applications, even when only one side is painted. Hot dip galvanizing plus special furnace treatment gives Galvannealed its weather-resistant qualities plus a surface exceptionally well suited to take and hold paint. Forming operations fail to damage these outstanding surface characteristics. Flaking or peeling is practically eliminated.

STEEL

and Steel Products

REPUBLIC STEEL CORPORATION
Dept. C-1956
3120 East 45th Street, Cleveland 27, Ohio

Please send me further information on:

☐ Bolts and Nuts ☐ ELECTRUNITE Mechanical Tubing
☐ Materials Handling Equipment ☐ Galvannealed Sheets

Name_____ Title_____

Company_____

Address_____

City_____ Zone_____ State_____

A YEAR AGO
nobody believed it!

GOULD & EBERHARDT
21" SHAPER
Installed (without cement, bolts or screws) on AIR-LOC pads that prevent machine from "walking".

Now, over 3,000 presses, lathes, etc. are installed on Air-Loc®

AIR-LOC is the *only* machinery mounting method that gives you all these advantages:

- You just sit the machine on AIR-LOC.
- You don't need cement, bolts or other fastening devices.
- You reduce transmitted machine noise and vibration up to 84%.
- You start machine right away—no waiting for cement to dry.
- You can re-use AIR-LOC because it is not cemented, does not "pad down".

You can mount up to 72 tons per sq. ft. on AIR-LOC with absolute safety.

Every order shipped same day received.

FREE BOOK TELLS ALL

AIR-LOC Division
Clark, Cutler, McDermott Co.
Franklin Mass.
Please send the booklet describing patented AIR-LOC to:

NAME (PLEASE PRINT)
COMPANY
ADDRESS
CITY ZONE STATE

(*Concluded from page 99*)

ville St., Los Angeles. It is equipped to machine structural sections for aircraft and missile fins and to taper mill aluminum and titanium sheets.

VACATIONS

All manufacturing plants of **Chase Brass & Copper Co. Inc.**, subsidiary of Kennecott Copper Corp., will shut down from July 2 to 16. They include: Chase Metal Works, Waterbury Mfg. Co. and Noera Mfg. Co. plants in Waterbury, Conn.; the Babbitt road and Upson road plants in Cleveland; and facilities of the Kennecott Wire & Cable Co., Phillipsdale, R. I. All Chase warehouses will remain open.

ASSOCIATIONS

John Schapiro, president of Boston Metals Co., Baltimore, was appointed chairman of the foreign trade committee of the **National Federation of Independent Scrap Yard Dealers Inc.**, New York. Harry Wische, Newark Iron & Metal Co. Inc., Union, N. J., is president of the federation.

Louis F. Fontana, Irving Subway Grating Co. Inc., Long Island City, N. Y., was elected president of the **National Association of Architectural Metal Manufacturers**, Chicago. Other officers are: R. E. Stitt, Acorn Wire & Iron Works, Chicago, E. M. Pollak, Illinois Bronze Works, Chicago, and W. P. Southwell Jr., Southwell Co., San Antonio, Tex., vice presidents; R. S. Woodbridge, Woodbridge Ornamental Iron Co., Chicago, treasurer; F. A. Austin, Crown Iron Works Co., Minneapolis, secretary.

Norman R. Prusa has been appointed field representative for the **National Screw Machine Products Association**, Cleveland.

John M. Yahres, who recently retired from the chairmanship of Pittsburgh Screw & Bolt Corp., was honored by a special award by the **Industrial Fasteners Institute**, Cleveland. It was in recognition of his 50 years of service in the industrial fastener industry.

J. J. Chyle, A. O. Smith Corp., Milwaukee, was elected president of the **American Welding Society**, New York. Other officers include: C. P. Sander, Consolidated Western Steel Division, United States Steel Corp., first vice president; G. O. Hoglund, Alcoa Process Development Laboratory, New Kensington, Pa., second vice president.

REPRESENTATIVES

Kenilworth Steel Co., Kenilworth, N. J., was appointed a special processing distributor for aluminized steel by **Armco Steel Corp.**, Middletown, O.

Hydra-Feed Machine Tool Corp., Ferndale, Mich., appointed these representatives to handle sales of its automatic and tracer lathes in their territories: Vandyck Churchill Co., New York, Philadelphia and New Haven, Conn.; McBeth Machinery Co., Pittsburgh, Cleveland and Cincinnati.

Elco Tool & Screw Corp., Rockford, Ill., appointed Roy A. Martin, Atlanta, as representative in Alabama, Georgia and South Carolina.

Brewer-Titchener Corp., Cortland, N. Y., appointed William Robinson Co., New York, representative for its marine and industrial hardware.

Tenney Engineering Inc., Union, N. J., manufacturer of refrigeration and environmental test equipment, appointed George P. Walker & Co., Minneapolis, as its representative in Minnesota.

Powell Pressed Steel Co., Hubbard, O., appointed J. E. Coleman Co., New York, distributor of its material handling equipment.

Yale & Towne Mfg. Co.'s Yale Materials Handling Division, Philadelphia, appointed S. L. Cooper Co., Washington, Radford and Richmond, Va., sales and service representative for Virginia.

WE DON'T STOP WITH THE DELIVERY OF A CHEMICAL—

we put it to work and keep it working effectively

The chemical treatment of metals and metal parts—to prepare them for further processing, to protect them, to beautify them—has grown from a haphazard operation to a highly technical one. Supplying the chemical ingredients is a relatively simple job. Putting them to work and keeping them working effectively in your plant demands the skill of an experienced organization. We have that organization.

We supply not only the metal-treating chemicals, but also—free of charge—the technical and engineering service to keep them working at top efficiency. We furnish assistance in developing and installing the process, we maintain continuing inspection of the process and equipment if you so desire, we check samples of the processed metals in our Quality Control Laboratories—all these are part of the ACP service at your command.

That's why we say, "We don't stop with the delivery of a chemical—we put it to work and keep it working effectively." And we have been doing this for over 40 years. Write for a booklet describing ACP products and services.

Some of the many ACP processes and chemicals used in the treatment of metals

PAINT BONDING

Granodine® forms a phosphate coating base on iron and steel products—provides an excellent bond for paint, and greatly improves the corrosion resistance of the paint system.

Alodine® forms an amorphous film on aluminum which protects the metal and anchors the paint finish. Alodized aluminum meets service specifications.

Lithoform® promotes a good bond for paint on galvanized iron, zinc and cadmium plated surfaces. Also prevents any objectionable chemical reaction between applied paint film and the metal surface. One grade of Lithoform, in itself, provides excellent corrosion resistance on zinc and cadmium.

PROTECTION FOR FRICTION SURFACES

Thermoil-Granodine® forms a manganese iron phosphate surface which materially reduces wear and minimizes galling by eliminating metal-to-metal contact. It is particularly effective during break-in period of bearing surfaces.

RUSTPROOFING

Permadine®—a zinc phosphate coating chemical—forms a heavy oil-adsorptive crystalline coating on steel. Bonds paint or such rust-inhibiting oils as Granoleum®.

Thermoil-Granodine®—a manganese iron phosphate coating chemical—forms on steel a dense crystalline coating which, when oiled or painted inhibits corrosion.

IMPROVED DRAWING AND COLD FORMING

Granodraw® for steel, Granodraw SS for stainless, and Alodine® for aluminum for an integral coating with the base metal which facilitates the cold mechanical deformation of the metal, improves drawing characteristics and lengthens die life.

A pioneer in the development and servicing of metal treatment processes

AMERICAN CHEMICAL PAINT COMPANY Ambler 19, Pa.

DETROIT, MICHIGAN NILES, CALIFORNIA
WINDSOR, ONTARIO

CHEMICALS
ACP
PROCESSES

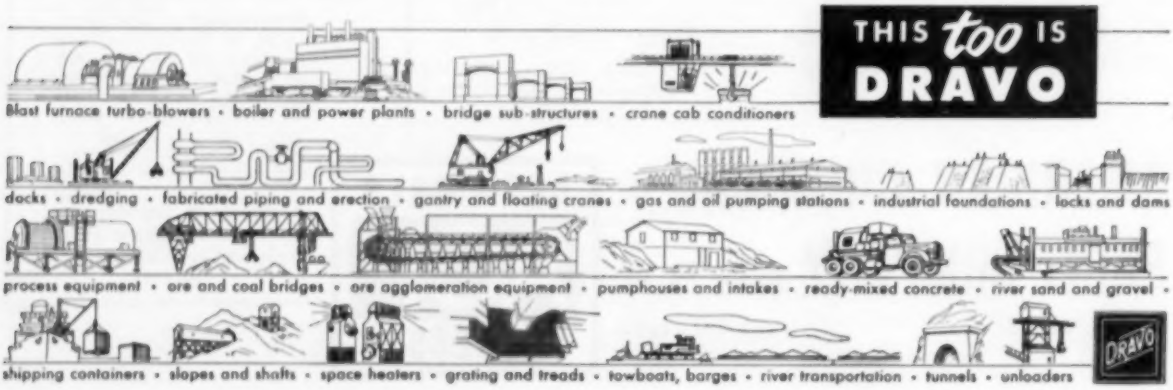
GIANT ORE SHIP COMPLETELY UNLOADED IN 30 HOURS!

This Dravo-designed and built ore unloader at Mobile, Alabama, is setting records in handling incoming Venezuelan ore for southern steel mills.

The new terminal, operated by The Marine Bulk Handling Corporation, unloads ore for use in blast furnaces at U. S. Steel's Tennessee Coal and Iron Division mills at Fairfield, Alabama.

As an example of high speed handling, an ore ship carrying thirty thousand gross tons is completely unloaded in 30 hours. In regular service, the Dravo machine has operated at a rate of 1800 tons per hour. Ore is moved from the unloader to railroad or river barge loading sites by belt conveyor.

Such performance is typical of many heavy material handling systems furnished for industrial plants and utilities throughout the country. It is further evidence of how Dravo has been serving business and industry in many engineering fields for over 60 years, with customer satisfaction always considered an essential aim in every transaction. DRAVO CORPORATION, PITTSBURGH 25, PENNA.


THIS too IS DRAVO
Blast furnace turbo-blowers • boiler and power plants • bridge sub-structures • crane cab conditioners
docks • dredging • fabricated piping and erection • gantry and floating cranes • gas and oil pumping stations • industrial foundations • locks and dams
process equipment • ore and coal bridges • ore agglomeration equipment • pumphouses and intakes • ready-mixed concrete • river sand and gravel •
shipping containers • slopes and shafts • space heaters • grating and treads • towboats, barges • river transportation • tunnels • unloaders
DRAVO

Material Handling Section

Integrated Handling: What It Means to You, 106
Bulk Handling in Steelmaking, 114
New Products on Display, 129
Exhibitors at the Show, 168
Handling Show Program, 168

Integrated Handling

INTEGRATION is the magic word among material handling men these days. Their line of reasoning is: Manufacturing and marketing depend on handling. Closer co-operation should improve the relationship, leading to greater profits.

Turnabout—Such an idea flies in the face of habit. Handling has too long been thought of as hardware like fork trucks, conveyors and tote boxes. Or as movement which adds cost where fabrication adds value. Or as a necessary nuisance, like maintenance.

It takes some shifting of view to agree that handling is:

1. A frontier where profit can be realized in big chunks (two-thirds of labor costs go for manual handling; 40 per cent of total product cost is handling).

2. An operation that can take on accessory jobs like counting, weighing, sorting, blending, storing and orienting without loss of efficiency.

3. A function so all-pervading that it influences manufacture from raw material to customer.

4. A service of such far-reaching importance that it needs a voice where it can be heard and will be listened to.

Upstairs—Take that last point. Few companies consider handling important enough to give it a formal voice (like sales) in upper management circles. Yet consultants and handling engineers have been talking for years of the advantages to be gained from more direct management interest in the subject. For instance, F. E. Cummings, principal of the management consulting firm of Drake, Startzman, Sheahan & Barclay, would centralize external and internal distribution under a director of physical distribution at the policy-making level. W. F. Rockwell Jr., president of Rockwell Mfg. Co., sees the rise of a new executive position, manager of movement.

Big Job

What would such a man do? Mr. Cummings says: "He should establish physical distribution policies and insure their successful application. He should educate carriers concerning distribution problems and enlist their compliance with requirements. He should enlist industrial engineering advice and assistance in the analysis of layouts, methods and procedures.

"He is in a position to speak up when sales programs are formulated without regard for the impact on transportation and warehousing, or when purchasing policies cause unnecessary handling and storage. With a voice in top management councils, he can make sure his company does not save money in one direction only to lose it on distribution."

Ramifications — Mr. Cummings might have gone further and suggested that when a product is designed, handling features (such as locating pads) can be designed into it that may be cheaper than later modification or special handling devices. Of course, that's done now, but hardly as routine policy. It's one of the many reasons for

putting a handling expert at a level where he can establish such policy.

Mr. Cummings might also have suggested that the man with specialized background up where he can get the big picture could do a better job of determining obsolescence and of planning replacements for handling systems. As a matter of fact, he could assure the existence of a true system—not one that is a haphazardly chosen and unco-ordinated collection of equipment.

Ten Opinions

Companies are bound to differ in their ideas of handling's place. This shows up sharply in a survey conducted by STEEL. Ten companies picked at random use seven different titles (from foreman to chief industrial engineer) for the people responsible for handling. Of the ten, three have a voice in the design of new products, and five in the purchase of manufacturing machinery. All but one are consulted on the layout of manufacturing lines.

Upgrade?—Only one of the ten feels that handling ranks in importance with manufacturing (rather than being strictly a service function). Even he didn't go all the way. Asked what he felt about combining in-plant and out-plant distribution under one director of physical distribution at top management level, this manufacturing manager (in charge of handling at his company) commented: "Not a good idea because it creates a separate staff function and withdraws problems from the line.

"Ours is a production job shop of 650 employees, making aircraft fittings. Handling problems seem to work best by discussing all phases of a problem with industrial engineering, production control, tooling, plant engineering and production to resolve the problem.

"We have, for example, established co-ordinated and integrated work areas for specific parts to eliminate unnecessary crosshaulage. Secondly, we have added individual jib cranes for each two machines to eliminate machine down time because of waiting for a crane."

Service — The emphasis of the other nine on the service nature of handling ties in with the point of view of F. C. Wier, superintendent of material handling for the Timken Roller Bearing Co. Here's what he says about handling's place: "The material handling department is strictly a service function. It must render service to such a point that people being served get what they think they should have. Any challenge of production policies by the service department must be indirect. The service must always stay subservient to the manufacturing procedures."

Mr. Wier has built a reputation for developing unorthodox and highly successful handling techniques. He pioneered, for instance, in the use of straddle trucks for steel handling, a classic example of leading by serving.

Middle Ground

R. B. Gesse, superintendent of procurement and maintenance of mobile handling equipment at Caterpillar Tractor Co. points out: "No single approach to material handling can be adapted to all

GEORGE G. RAYMOND JR.
President, Material Handling Institute Inc. explains . . .

What Integrated Handling Means

THE ESSENCE of integrated handling is control, too often conspicuous by its absence.

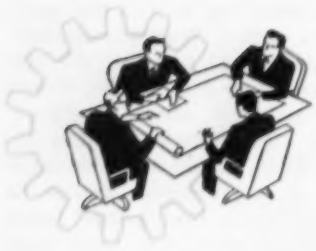
Material is unloaded from a freight car and set down. It is picked up again and moved to a manufacturing station. At various stages in the production process, it hangs from a conveyor, lies on a shelf, gets lost in a tote pan.

Typically, the operation of the unloading dock, the design of the conveyor, the location of the shelf, the kind of tote pan . . . have not been integrated decisions. The result has often been inefficiency and unnecessary cost.

The idea of integrated handling is to tie these separate aspects together from the planning stage forward. As soon as you start to do that, you realize that handling is a problem in material control that cuts across purchasing, inventory, external movement. To develop handling control comparable with purchasing, inventory and traffic control calls for an over-all, not piecemeal, approach.

That means control at the management, policy-making level.

It also means increased productivity, reduced cost of finished products, improved working conditions and better distribution.



Ten Areas for Management Action in Handling

- Planning for handling at the product design stage
- Creation of master handling plans, including over-all distribution
- Design of new plants for most effective handling
- Institution of studies to determine handling costs and savings through improved methods
- Reward of personnel for contributions to more effective handling
- Solution of personnel problems arising from mechanized handling
- Acceptance of calculated risks in new handling methods worthy of a fair trial
- Promotion of greater safety through modernized controlled handling
- Backing for ideas such as unit loading that offer the possibility of space and money savings
- Elimination of overlapping and conflicting handling functions

types of businesses. However, possession of all the facts, adequate records and cost figures cannot be overlooked in evaluating an economical material handling operation."

Caterpillar realized in 1947 that its material handling methods had not kept pace with production. An objective was set to gear handling to production with the least interference to manufacturing schedules, and with greater safety and economy.

Gains—Recognition of handling in its entirety has brought about a more efficient organization. Handling became a more active function of management through reorganization of responsibility.

Unit loading has eliminated much piece-by-piece handling and greatly increased the effectiveness of mechanized equipment. Emphasis on employee training and standardization has done much to improve safety and increase proficiency. Labor turnover has been reduced at Caterpillar by eliminating hand labor on fatiguing jobs.

Another Voice—A. K. Strong, head, Material Handling Division, Chemical Construction Corp., American Cyanamid Co., makes a forceful argument for upgraded handling. "Few companies," he says, "recognize handling as a major function. Their accounting procedure does not reflect the true cost of moving material. On a national scale we spend over 25 per cent of our industrial payroll just moving things.

"Once the major areas of handling expense are determined, management can begin taking corrective steps. It will have a basis for cost comparison when improvements are installed.

"The material handling man in your company should be placed high enough to be effective in every branch of the company. He should report to a vice president at least.

"Do not misunderstand this line of reasoning. The material handling man can never successfully command anything. He must win co-operation by doing a good job and selling his services and ideas. He will be more effective if his position on the organization ladder commands respect from other department heads."

Costs — Lincoln Electric Co., Cleveland, is a company well aware of handling costs. Its modern plant represents an $8½-million investment largely for more efficient handling. It has been called "a stockroom with a built-in factory."

No one man has formal charge of handling at Lincoln. Stock handling is largely under production control. Planning the lines of flow is under plant engineering. Two years before the new plant was built plant engineering was trying out ideas for it on a pilot scale. From the layout and handling studies, two principles evolved to guide the design of the new plant:

1. Location of machines and their operators should be determined by the weight and minimum movement of materials.

2. No piece should be handled twice in the same form. When material is moved, it must be set down at the next point of use.

Integrationists

Study—When D. S. Harter came to Ford Motor Co. in 1946 as ex-

ecutive vice president of the basic manufacturing division, he felt that saving through better material handling was a vital need. He also felt that the logical way to do it was to engineer and study it like any other manufacturing problem.

He set up the material handling engineering department of the manufacturing staff, under Jack C. Downes. This department cuts across all levels of Ford's manufacturing operations. It has functional supervision over the material handling sections of each manufacturing department or division.

As Downes puts it: "Our function is to carry on experimental engineering in better material handling methods; to set up standards for each department and division to use as a guide; to install different procedures in the divisions; and to evaluate performance."

Self-Help—He adds that each department or division still is supposed to work out its own material handling problems. If they get stuck, they can come to the staff group.

It is there to act as a co-ordinating unit. Since it is well removed from each group or division, it can be more objective in evaluation of material handling.

Much of the staff group's experimental work is concerned with packaging and developing power trucks of 5000-lb capacity which can operate in narrower aisle space. A cost reporting system should be in operation in the next six months. This will show just how each material handling section of each department and division spends the money allotted to it—and how much they are saving during a year.

Group Planning — General Motors has a general material handling activity made up of eight separate groups. These are: Industrial truck, highway and railway equipment, containers, conveyors, loading and unloading, measuring methods, export packing and operations analysis. They have been functioning since 1948 and meet three or four times a year to work on projects, help solve current problems and consider projected plans. Key material handling personnel from the divisions are group members.

Signs of Dis-Integrated Handling

- High indirect labor costs
- High overhead expense
- Many handling accidents
- Manual handling of heavy loads
- Skilled employees handling material at machines
- Delays due to materials not present or not removed
- Production or materials jammed up at some point
- Space (including that overhead) not efficiently used for storage
- High demurrage charges
- No attempt at unit loads
- Material damaged during handling
- Goods misplaced
- High maintenance cost of handling equipment
- Repeated movement of same goods
- Shop trucks operating empty more than 20 per cent of time
- Overlapping lines of material flow
- Power equipment operating where gravity would do
- Expensive specialized equipment used for routine jobs
- Standardized equipment used for all kinds of jobs

"Increased production and advanced methods mean increased mechanization of material handling," says G. E. McNeive, superintendent of material handling and production control at GMC's Truck & Coach Division. "This will mean more equipment, more conveyors, more containers, more industrial trucks, with the emphasis on versatility. GM people are looking forward to such devices as electronic weighing of loads on industrial trucks and increased use of specified and expendable containers."

From 6 to 8 per cent of the employees of the Truck & Coach Division are material handling labor. The main effect new handling equipment has on them is to improve and upgrade their positions. "The biggest need for trained material handling personnel," says Mr. McNeive, "is before and after the in-process operations—getting materials to the lines and getting finished materials away from the lines."

Full Control—In the past year, RCA Victor Co. Ltd., Montreal, has

recognized handling as a separate function. It has been placed under a manager of material control, who reports to the vice president of finance, an unusual chain of command that emphasizes the cost-cutting job to be done.

This manager's function goes beyond the manufacturing lines into the distribution warehouses where he recommends handling methods to tie in with manufacturing. His interest extends to palletizing and packaging methods best suited to the requirements of the consumer, which may be outside sales or his own company.

The Summing Up

The way handling becomes everybody's business is most apparent when a new plant is on the drawing board. Unless responsibility for handling is pinned down firmly, the old saw, "everybody's business is nobody's business," is too likely to come true.

An example is GE's Appliance Park. Each building is a self-contained manufacturing plant, tied to the others by little more than utility lines and a fabulous conveyor system. The idea for the common conveyor was championed from the first by the head of the task force that conceived and built the park.

Old Timer—There are plenty of other situations where integrated handling is called for. Take the case of the company that has to live with an antique. Multiple floors, chopped up work space and narrow aisles can hamstring a business. They can also be the making of a handling specialist.

Don't expect much if he is limited to putting out fires. The old plant, tackled as an entity, may turn up handling surprises far cheaper than starting from scratch in a new building. Besides, the old plant offers opportunity to try out handling ideas for that new plant you want to build some day.

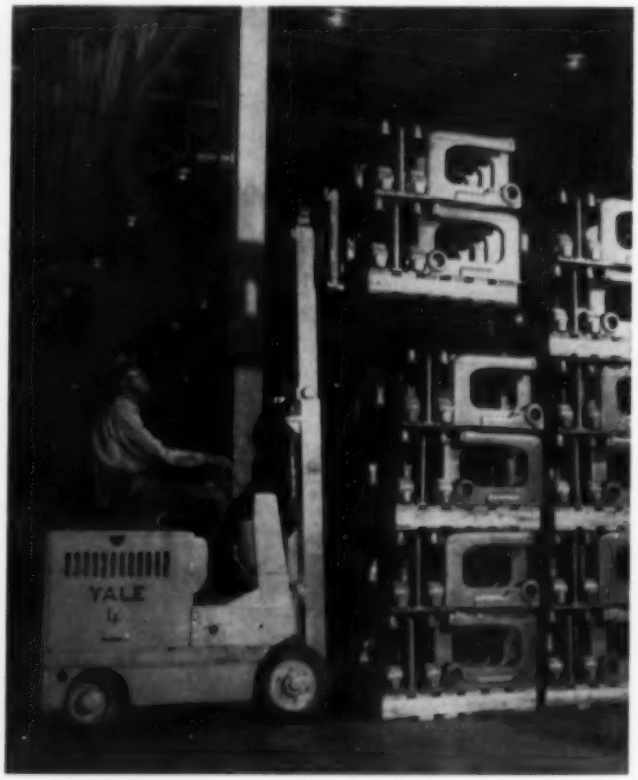
More of Same—The purchasing agent faced with another requisition for pallets has some questions to ask. They boil down to: "Are pallets the answer? Maybe we should be using something else."

Here's a task for integrated handling action, for the whole process of manufacturing and shipping

Spotting the Trends

THE HEART of successful handling is control, but you can't have control unless you know what is going on. Here is what is going on in the world of handling:

Automation—Conveyors have long been adaptable to automatic operation. Automatic cranes, remotely controlled trucks, loading and unloading devices show the extension of the trend



Unit loads—The principle of moving material in easily handled modules, rather than as individual units, is being widely adopted. Standard loads are determined by such factors as industrial truck capacity, pallet size, conveyor width and storage area cubage. One thing holding back the unit load idea: Lack of freight cars and trucks that will accept unit loading without waste space

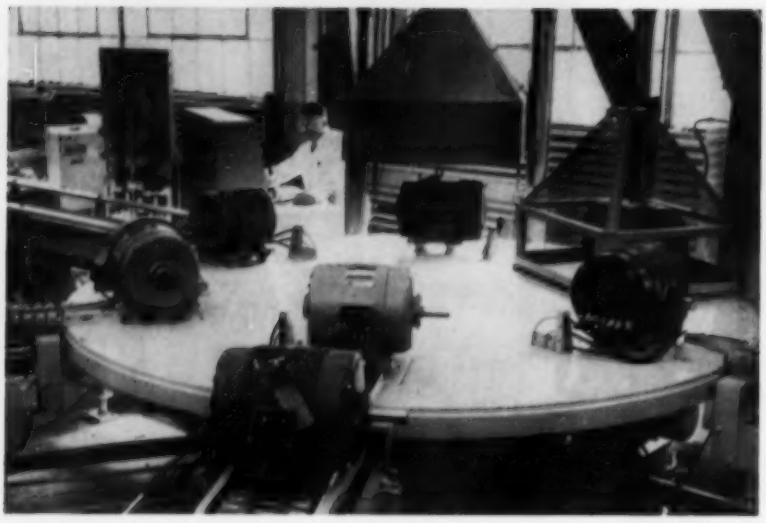
Standardization — Industrial trucks in a range of sizes are being made with interchangeable parts; there's some standardization of mounting flanges for components, such as motors and air cylinders, but standardization in handling has a long way to go. Standardization is making progress because of the great savings it offers

More strength, less weight—Stronger, lighter materials are turning up in dockboards, semitrailers, crane booms. They mean less energy expended and a greater payload

Specialization—Where volume warrants it, there's a tendency to go to specialized equipment, or specialized accessories, such as grabs and rotating devices on standard lift trucks

Communications—Use of short-wave radiophone for centralized control of trucks and cranes is becoming commonplace. Closed-circuit TV for handling control still has a lot of growing to do

Space saving—Trucks with shortened wheelbases and containers that can be collapsed for storage and stacking empty are examples of the trend to pack more in less space, making more work area available. Tiering, high stacking, vertical conveyor banking are being widely used to take advantage of wasted "air rights"



Handling man's dream: GE's low integral horsepower motor plant where even the testing is automated

Triple-Play Production

BUILDING 85, GE's new plant at Schenectady, N. Y., which makes low integral horsepower motors, is a handling eye opener. It is really three factories under one roof.

There are three parallel production lines. The two outside lines are high-volume, low-variety facilities to mass-produce 100 standard motor models. The center line is a low-volume, high-variety facility which draws standard parts from the two outside lines and modifies them to make special motors. Materials entering one end of the plant move in almost straight lines until they emerge in finished, boxed products at the other end.

The plant was conceived as one integrated machine. A manufacturing engineering group consisting of designers, manufacturing engineers, procedure specialists and product planners worked out the plans co-operatively.

Where was material handling in the picture? No one on the planning task force initially qualified as a "material handling specialist." Special training was given to the member who was made responsible for handling.

Now that the plant is operating, the manufacturing engineering group continues to function, but as an evaluating body. It looks ahead to future needs and recommends modifications as the original plans shake down in practice.

may be involved. Someone has to take the responsibility for finding out and for putting recommended changes into action.

Preplanning — When Alabama Pail & Barrel decides that automation is the key to staying healthy in the container business, will a handling expert be in on the decision? If the plans suit the suppliers, the shippers, the sales force, as well as manufacturing, there is less chance of automatic handling becoming the weak link in the production chain.

The company can be leery of the results if it approaches its handling supervisor with drawn plans and says: "Here's what we're going to do. What's the best kind of conveyor to run from here to here?"

Up and Up—These are the days of "air rights." More companies would be using overhead conveyor storage or high stacking if floors and roof trusses had been designed in the first place for such economical use of space.

When you can't go up, or use freight car in-transit storage, or let your supplier or your jobber hold your inventory, what do you do? A handling voice in the right place to be heard might find the answer in redesign of the product or package to cram more into less area. The impetus for miniaturization, for instance, can arise from handling necessity.

Five Ways—George G. Raymond Jr., president of the Material Handling Institute, points out five ways in which integrated handling helps increase production and cut costs:

1. Nonproductive time lessened —This is the basic contribution of an integrated material handling system. Idle machine time is reduced by a steady flow of materials. Workers spend little time waiting for work or manhandling materials.

2. More hands for production— When mechanism takes over the muscle work, nonproductive employees are released for productive work. Upgrading is possible.

3. Safety improved—Mechanical handling is safer than manhandling.

4. Space used effectively—With integrated handling, the entire cubage of buildings, plus outdoor areas, becomes available for storage. Storage at point of use becomes practical without cluttered floors.

5. Pace set for production— Properly integrated handling becomes the strong link in the manufacturing chain. It should never slow the production rate, and can be the means of speeding it.

Genius—All this seems to call for a fully rounded specialist. Where do you find him? He might come from the ranks of industrial or material handling engineers. He may be a consultant.

But the chances are you will find him right in your organization. He'll know your business to begin with, and given a chance, he can learn what he needs to know about handling. The important thing is to find a man who wants to learn what handling has become, and who believes in where it can help production to go.

vertical edging mill

The overhead design of this edging mill is the key feature of this typical PITTSBURGH installation. Increased operational efficiency is a natural result of special design.

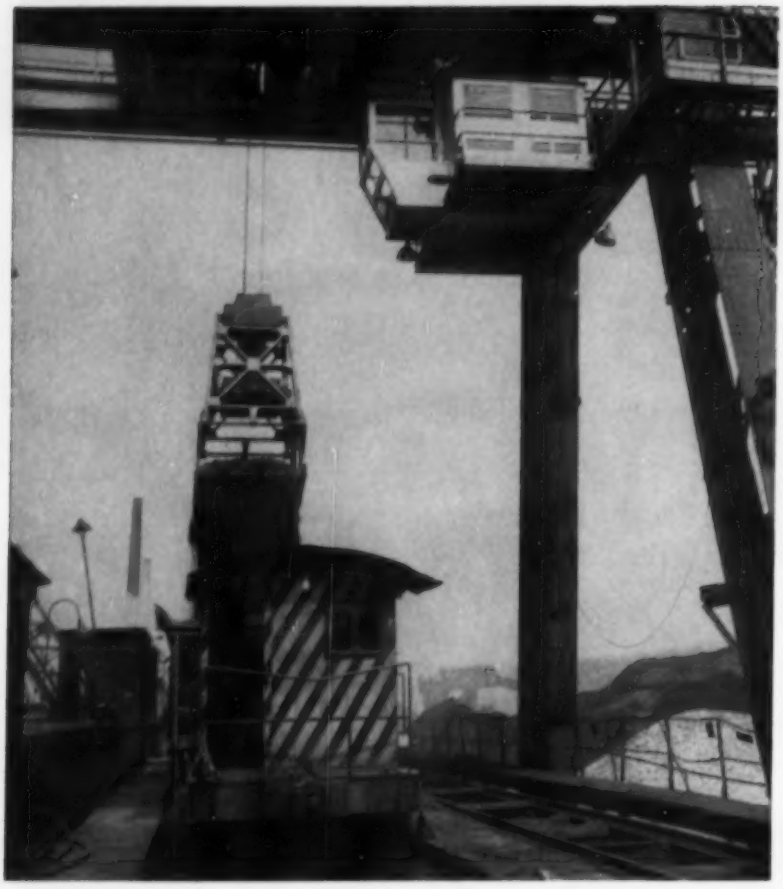
One giant casting *outlined in yellow in the photograph* was produced by Pittsburgh Steel Foundry Division. Extensive machining facilities are combined with one of the largest steel foundries in the world to produce the finest possible equipment for our customers in the shortest possible time.

We invite your inquiries for primary and auxiliary rolling mill equipment.

"Electric and open hearth steel castings from 1 lb. to 100 tons"

Pittsburgh
ENGINEERING & MACHINE CO.

Division of Pittsburgh Steel Foundry Corporation
P. O. BOX 986, PITTSBURGH 30, PENNSYLVANIA
PLANT AT GLASSPORT, PENNSYLVANIA



Ore bridges: Mill expansion taxes their capacity

Report on Bulk Handling

U. S. STEEL Corp., Pittsburgh, recently made a systematic study of its material handling costs. Its approach to the problem could be a model for other steelmakers.

"We realized we had to know what performance we were experiencing before reaching for changes," comments J. L. Kerins, general transportation manager of the corporation's central operations.

"In the last two years, central operations installed a series of controls which show our material handling performance and its cost. Any cost of material handling is interpreted as a standard dollars-per-ton rate for which we should receive a standard performance. We break down costs into two phases—costs from point of origin of a commodity to delivery at a plant and expenses while processing material into a finished product."

Subdividing — The breakdown: "Phase No. 1 includes loading, freight and related unloading charges. Phase No. 2 consists of such 'fence to fence' costs as terminal transportation services, demurrage, damage expense, maintenance, weighing and outside purchased transportation services."

The corporation's central operations division develops a cost analysis for each plant immediately after the end of each month. Cost data are broken down into operating divisions within a plant, and each division itemizes costs under each phase.

Itemized costs and the budget for each division are reported. Management analyzes these data to get at total plant performance. Plant transportation managers review these results regularly in company headquarters, their talks pointing up good, economical practices for all plants to follow. They spotlight areas of high cost, suggest solutions and establish new objectives.

Cost Question—"Many operating men don't know their handling costs. Steelmen may forget that handling of materials comprises almost one-third of their total operating cost," comments R. C. Sollenberger, executive director, Conveyor Equipment Manufacturers Association. "Economical handling of materials is one of the last large areas available for cost reduction."

Equipment makers point out that when a product is moved, adjusted or stored, it adds to final cost through labor charges. There is no compensating increase in value. Badly needed by some manufacturers is a cost accounting system which will segregate material handling costs and show top management how much is being spent to move materials.

Lack of Foresight—Equipment makers can point out where manufacturers have missed potential savings by designing and building plants without advance planning of handling facilities. Failure to consider handling problems early in planning can cause expensive work later.

"We like to get into new plant planning sessions as early as possible," say engineers for a midwestern equipment producer. "Cooperation between engineers of the steelmaker and the equipment producers pays off in lower handling cost per ton mile."

Systematic Study—"The preferred approach to a material handling study for a new plant or modernization of an existing facility consists of three basic steps," says Hamilton Beatty, assistant general sales manager, Austin Co. "First, reduce the handling, then consider all possible methods for the remaining

POOR WORRYIN' WILLIE, JUST CAN'T SEEM TO GET HIS NOSE AWAY FROM THOSE WICKET-HOLES WORRYIN' ABOUT HIS HEAT. GOT HIS NOSE LOOKIN' LIKE THE ORIGINAL RUDOLPH, THE RED NOSED REINDEER
YEAH, THE WAY HIS SCHNOZ BLOOMS, BILL HAS A TOUGH TIME CONVINCIN' HIS BEST FRIENDS HE'S A TEETOTALER
KLEKER

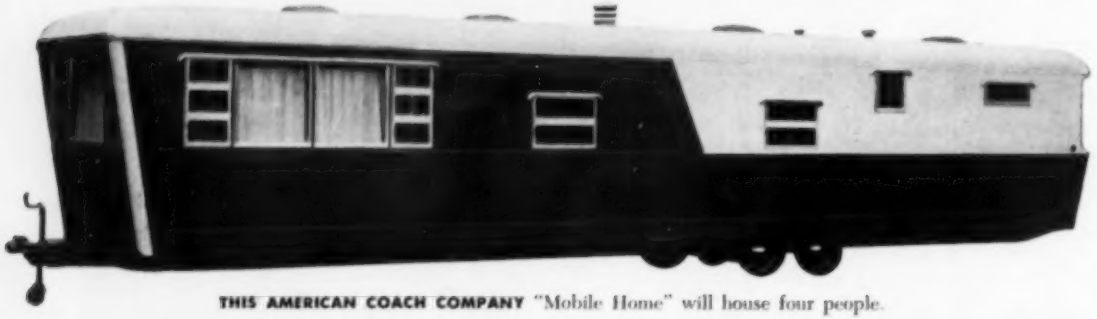
Willie, the wicket-watcher

The benefits steelmakers obtain from our refractories are in part a result of Basic's on-the-job servicing. One of the rewards of this close relationship has been the opportunity to observe and appreciate the lighter side of these usually serious craftsmen.

BASIC INCORPORATED 845 HANNA BUILDING • CLEVELAND 15, OHIO

One operator completes 200 feet of welds a day

Fast Braze Welding with smooth-flowing Everdur*-1010 Welding Rod makes sleek, tight roofs for American Coach Co. "Mobile Homes"



THIS AMERICAN COACH COMPANY "Mobile Home" will house four people.

Braze welding a roof corner on 19-gage zinc-coated steel. One operator welds, grinds and prime-coats 200 linear feet of joints in a day.

Rear wall corner of 24-gage zinc-coated steel, also braze welded. The 22 corner sections needed for a day's production are completed in one hour.

Eleven big "Mobile Homes" a day come off the production lines of American Coach Company, Cassopolis, Michigan, and Newton, Kansas. On the roof of each, four corner segments are braze welded by the inert-gas tungsten-arc method, using filler rod of Everdur-1010, one of Anaconda's well-known copper-silicon alloys. Two rear corner posts are also braze welded in the same way.

"We prefer Everdur rod," says M. E. Wickersham, vice-president in charge of engineering and production for American Coach Company, "because it flows easily and enables our operator to weld rapidly—and because the welds are resistant to corrosion at these critical points. High welding speed means a minimum total heat input and, therefore, the least distortion in the metal and the least effect on the galvanizing."

Besides helping to make smooth and strong roofs, these Everdur braze welds help to keep them waterproof, for Everdur is nonrusting and highly resistant to many types of corrosion.

Everdur-1010 is one of nine Anaconda Welding Rods finding ever-increasing application in production and repair work. Anaconda Welding Rods are available from distributors throughout the United States and Canada. For help in selecting rod, see your distributor or write: The American Brass Company, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ont. 56110

*Reg. U. S. Pat. Off.

ANACONDA® **WELDING RODS**

handling. Finally, select the most economical and practical plan."

Material handling engineers stress that the principal aim of a good handling system is to increase productivity. A firm makes an extra investment to improve its movement of materials; improved output will eventually pay back the investment.

New Ways — Steelmakers are well aware that you can't run a 1956 steel plant with a 1900 handling system. They are designing new plants to take advantage of the latest equipment and revamping older installations to get the advantage of quicker, more economical handling.

Allegheny Ludlum Steel Corp. recently announced completion of a modernization program at its Buffalo plant. It is designed to "increase production, speed deliveries and insure continued high quality of product by streamlining the flow of material through the plant. Time was being wasted in flow of materials. Now, one production step logically follows the previous one," says Lewis Polen, plant manager.

New Problems—"In selling material handling equipment, we must be engineers more than salesmen," stresses Thomas L. Griffith, manager of material handling sales, Pittsburgh Steel Products Division, Pittsburgh Steel Co. "We must visualize the potential customers' needs and then work to solve his problems."

What are some of these problems? An eastern steelmaker says: "We need better mobile machinery to handle hot materials. This general field is practically untouched by anything other than railroad equipment."

More Needs — The steelmaker adds: "Mill congestion requires trucks to carry 50 or 60-ton loads at economical prices to provide plant fluidity. This equipment must be used with minimum changes to plant roadways and clearance.

"We also need more specialized transportation services in bringing materials from point of origin to the manufacturing plant, and taking finished products from plant to final destination. More imagination is needed in developing equipment for these operations. To be developed and solved are such techniques as loading or unloading a barge in 1 hour instead of 8 hours through putting lifts on and off the barge in carload lots instead of 10 to 15 lifts per car."

Conveyors: Mills will use more for handling bulk materials

One steel firm in the Pittsburgh area is attempting to meet the problem of slow loading and unloading of barges by designing the craft along lines of a wartime LST. A truck can drive directly onto the barge and be unloaded or loaded by mobile equipment. Another possible solution is development of self-unloading barges for handling such bulk materials as coal and ore.

Goals for Future—The eastern steelmaker quoted previously cites these goals: "We should have still better methods for faster loading and unloading of van-type and flat-bottom trucks and all types of railroad cars. Growth of sintering and other high-temperature operations increases the need for equipment to handle and transport hot materials.

"Material handling costs are total costs from point of origin to point of consumption. It is not enough to improve any one item such as packaging. What is important is the sum total. We should not ignore other fields, which, under strong developmental emphasis, should provide attractive goals."

A swing around the country shows the sort of progress being made toward some of these goals in the bulk handling field.

Better Raw Materials — Link-Belt Co. has completed a coal preparation installation at a Rachel, W. Va., coal company. Conveyors take coal from mines. It's mixed, crushed, screened, cleaned and classified. Steel plants are stressing importance of uniformity of raw material. Pressure is on the coal suppliers to put out a good, clean product.

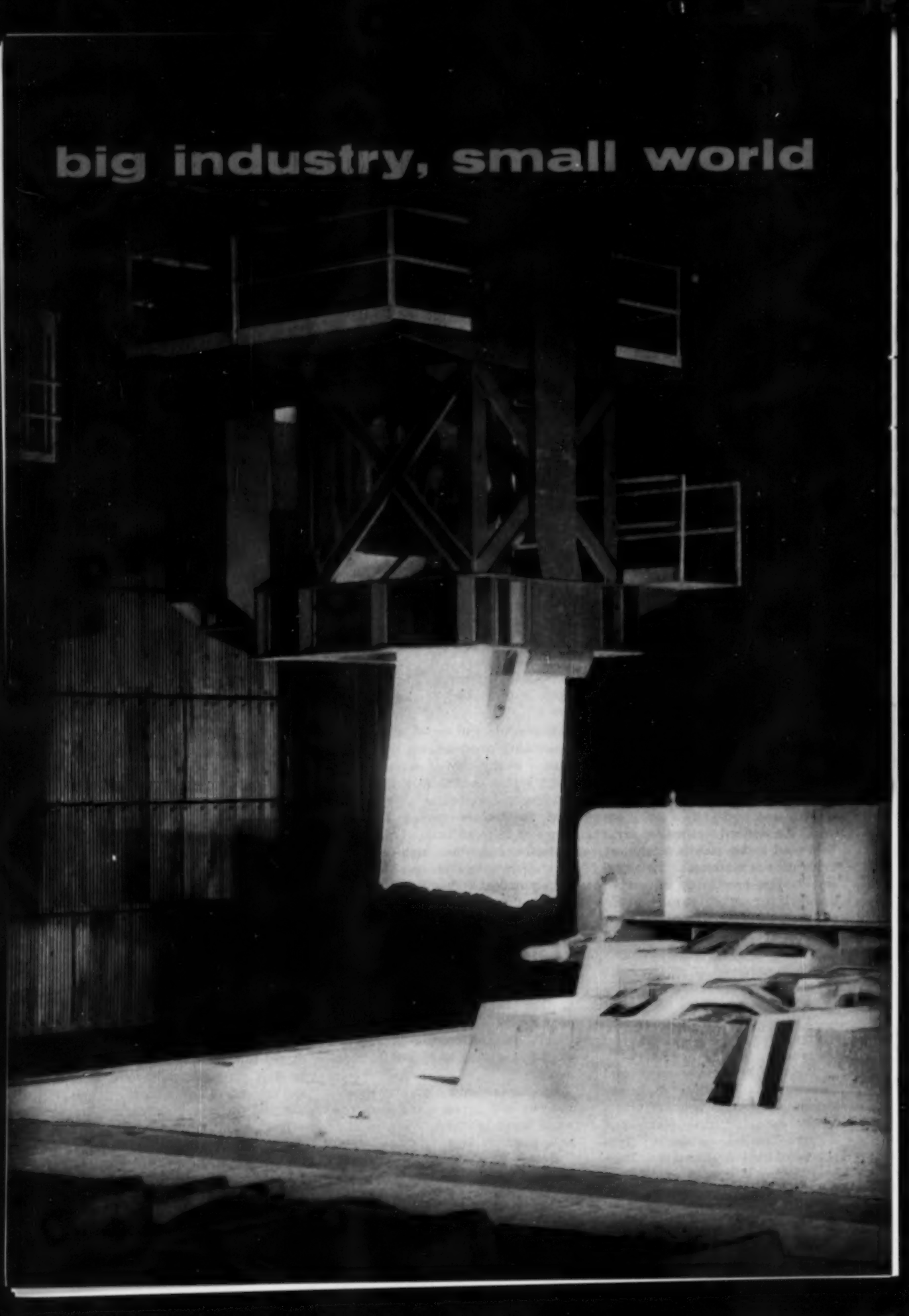
Recent iron ore mining projects integrate drilling and loading at the working face, underground haulage and surface loading facilities. Equipment builders recognize the growing importance of low maintenance expense in conveyors, which often must operate in remote locations as the search for ore widens.

For example, at the Wabana mine of Dominion Steel & Coal Corp. Ltd., on Bell Island, Newfoundland, a belt conveyor system hauls ore up a 12,500-ft slope tunnel from mines below Conception Bay. Stephens-Adamson Mfg. Co. of Canada designed the system. Goodyear rope belts deliver 1000 tons of ore an hour from the mine.

Delivery Improvements — Movement of raw materials to plants is due for a face lifting. Representative of the new thinking is a collapsible container (the Sealdbin). It is built of two or more plies of high-strength cord fabric and synthetic rubber vulcanized into one piece, with steel cables spaced through the interior. Designed for handling such materials as lime, alumina, pulverized sand and cement, the containers collapse and fold for return shipment. It's a product of U. S. Rubber Co.'s Container Products Division, Providence, R. I.

A new ore terminal in Mobile, Ala., built for Tennessee Coal &

big industry, small world



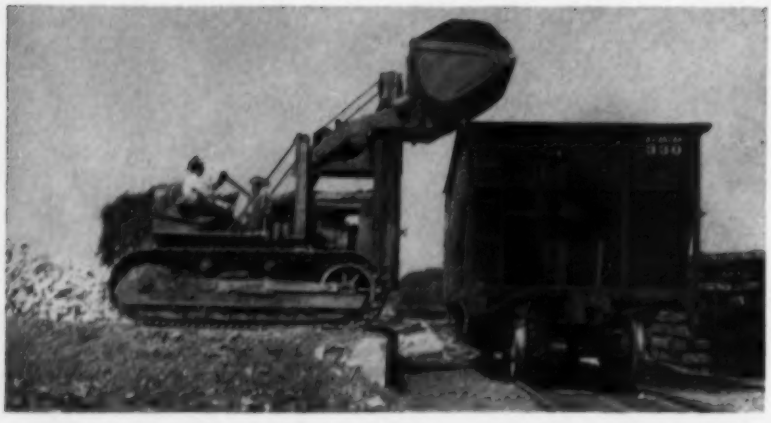
annealing covers
billet reheating furnaces, continuous
carbon restoration and annealing furnaces, continuous
controlled atmosphere generators
high-speed stress relieving furnaces
one-way fired soaking pits
pit-type annealing furnaces
slab and billet heaters, continuous
strip annealing furnaces, continuous
strip galvanizing lines, continuous
wire patenting furnaces, continuous

Wherever this steel goes—from first soak to final shipping dock—it will find that the big steel industry is a small world as far as 'Surface' equipment is concerned. Somewhere along the line, whatever its destined shape, the steel will be made more workable and more useful in 'Surface' furnaces.

Why is it so easy to bump into 'Surface' in steel mills? One reason is that 'Surface' has literally grown up with the steel industry. A better reason is the confidence that steelmakers have in the performance of furnaces and generators manufactured by Surface Combustion Corp., Toledo 1, Ohio.

Surface
STEEL MILL FURNACES

Foreign associate companies:
British Furnaces, Ltd., Chesterfield; Stein & Atkinson, Ltd., London
Stein & Roubaix, Paris, Liège, and Genoa; Chugai Ro Kogyo Kaisha, Ltd., Osaka
Benno Schilde Maschinenbau, A.G., Bad Hersfeld (Hessen, Germany)



Front-end loading trucks and tractors: Proved on cleanup, they offer possibilities for much wider bulk handling use

Iron Division, U. S. Steel Corp., includes some recent developments in bulk handling. Officials of Dravo Corp., Pittsburgh, builders of the unloader, report: "Substantial savings in power costs and minimum maintenance are among the outstanding features."

Getting Bigger—"The trend is to larger equipment in unloading bulk materials from barge or freight car," report engineers of Heyl & Patterson Inc., Pittsburgh. "Conveyor belts are moving faster, and we increase bucket capacity to give the steelmaker what he wants—quick, economical operation." In line with this requirement is the trend to a single operator for all handling equipment.

To guard against stoppages in supply, mills are making ore storage yards larger. This requires larger conveyor systems, ore bridges with greater capacities and more automatic controls. Bethlehem Steel Co. has just added a tremendous conveyor at Sparrows Point to keep its blast furnaces in ore.

Added Improvements—Already, equipment makers are giving steel mills a taste of the future in dual-purpose installations of ore bridges for ore handling and unloading, and by economical use of power through adjustable voltage in cranes.

While new facilities are the answer to better handling for some plants, others revamp existing equipment. At Granite City Steel Co., a large bridge supplied blast furnaces with ore, coke and limestone and handled coal for the coke ovens. As production increased, the ore bridge couldn't keep raw material bins filled. Although the bridge was in top condition, the trolley handling the bucket was virtually worn out.

Trolley — Dravo designed and built a new lightweight man-trolley which handles a 12-ton capacity bucket (the original trolley was designed for a 7½-ton bucket). To reduce weight of the new trolley, Dravo used liberal amounts of aluminum and alloy steel in its construction. Engineers erected the new trolley without interfering with blast furnace production.

Conveyor belts play a vital role in planning modern material handling systems. "Today, only the user's imagination limits potential for conveyor belts," say officials of Goodyear Tire & Rubber Co., Akron. "Belt conveyors can operate over grades three times the usual maximum limit for trucks." Economics, not engineering possibilities, is the determining factor in belt installation.

The modern plant designer finds the conveyor belt trending from specialization as an intraplant carrier to general duties as a carrier of bulk materials on long hauls between widely separated plants, or from mine to mill.

New Unit—Joy Mfg. Co., Pittsburgh, reports a new flexible conveyor idler (Limberoller) which centers the load, guides the belt and provides a cushioned ride. Result is that idlers can be spaced at least 50 per cent farther apart than conventional ones to reduce costs and speed installation.

Koppers Inc., Pittsburgh, will build more than 70 conveyors at Great Lakes Steel Corp., Detroit, to bring raw materials into the plant, distribute them between three ore yards and bring them to the sintering plant. The conveyor network will be pushbutton controlled from a central location to co-ordinate the entire operation. A master control panel will show movement of each belt.

Producers of overhead conveyor equipment join in the trend to spread the range for equipment moving bulk materials. "We can carry heavy loads great distances overhead without operators, safely, at low cost," point out officials of Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, O.

TV Too—J. H. Peritz, executive secretary, Electric Overhead Crane Institute, Washington, says: "Cranes are no longer only lifting and carrying devices. In metalworking plants, overhead cranes utilize radio and television for remote control operations, and transfer interlocks to widen their operational range. Possibilities for future improvements through industrial television are fascinating to the crane manufacturer."

Representatives of Clark Equipment Co. report: "While 'workability' is still the most important design aim, fork truck manufacturers will pay more attention to the operator and the maintenance man. We see increasing emphasis on operator comfort, safety and ease of maintenance."

Foundry Service — Fork lift trucks are taking over many new bulk handling tasks. Dalton Foundries Inc., Warsaw, Ind., uses Clark fork trucks at the malleable iron furnace, in the annealing department, in cleaning and grinding departments and on the shipping dock. A truck with a dump-type tub loads the malleable furnace with scrap and pig iron, saving time and thereby cutting labor costs.

"Power trucks assure the flow of materials and parts to and from machinery to synchronize with its output," Elwell Parker Electric Co., Cleveland, adds. "Double or triple-decking of bulk materials in tote boxes can multiply storage space."

UNITED®

EXPANDING MANDREL TYPE

DOWNCOILERS

Produce

STRAIGHT SIDED COILS

STRIP WIDTHS 16" to 94"

GAUGES .047" to ⅛"

COIL DIAMETERS

Up to 74" O.D.
28" to 30" I.D.

COIL WEIGHTS

Up to 35,000 lbs.

SPEEDS

Up to 2,380 F.P.M.

Complete information, without obligation is yours for the asking.

UNITED®

UNITED

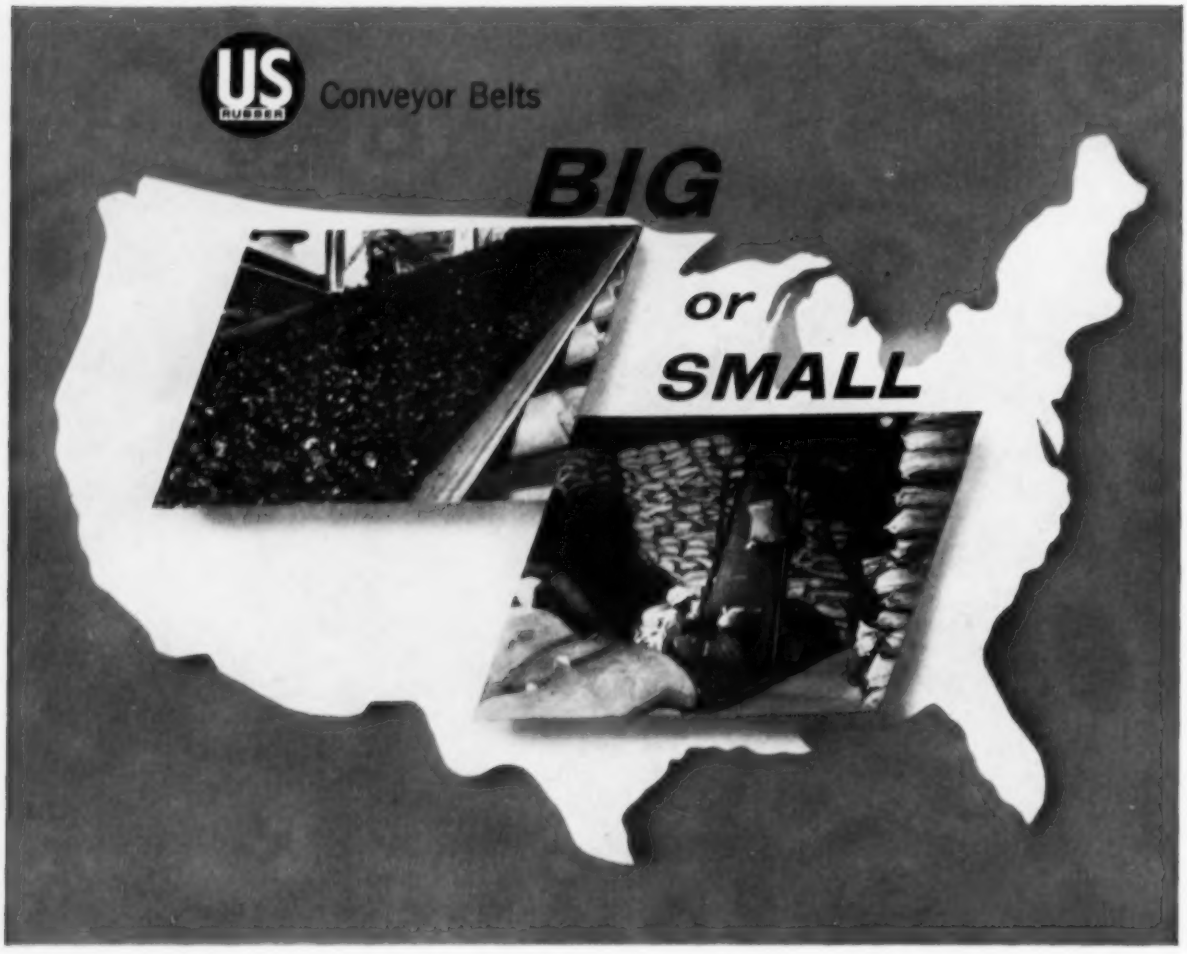
ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

Plants at—Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington (Labdell United Division)

SUBSIDIARIES: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Company, Inc., Aurora, Indiana

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.



make the nearest "U. S." Sales Office your port of call!

Whatever your conveyor belt needs may be—your convenient "U. S." District Sales Office is your supply point. Here's what it offers:

- The most complete line of belts available
- Fast delivery
- Expert splicing service
- Belt engineering and conveyor design help
- A no-obligation survey of your belting needs

The "U. S." belting engineer will show you the unique "U. S." conveyor belt kit which enables him to build, right before your eyes, a miniature sample of the right type and size of belt to fit your needs.

So whether you're involved with long hauls and heavy loads of ore, oats, or aggregate—or small distances and light weights, such as peas, packages or parts—contact any of the "U. S." offices listed below. Or write us at Rockefeller Center, New York 20, N. Y.

Atlanta, Ga.
999 Lee Street, S.W.

Baltimore 5, Md.
500 N. North Point Road

Boston 6, Mass.
560 Atlantic Avenue

Buffalo 3, N. Y.
133 East Swan Street

Charleston, W. Va.
706 Morris St. at Smith St.

Chicago 32, Ill.
4135 South Pulaski Rd.

Cincinnati 37, Ohio
4921 Para Drive

Cleveland 3, Ohio
7208 Euclid Avenue

Dallas 9, Texas
6125 Peeler Street

Denver, Colo.
4800 Colorado Blvd.

Detroit, Mich.
2121 West Fort Street

Houston 20, Texas
5711 Armour Drive

North Kansas City 16, Mo.
16th and Swift Avenues

Los Angeles 58, Calif.
Soto & E. 46th St.

Milwaukee, Wis.
1314 North Seventh St.

Minneapolis 1, Minn.
400 Second Avenue, N.

New Orleans 25, La.
900 S. Jefferson Davis Parkway

New York 13, N. Y.
191 Hudson Street

Odessa, Texas
912 North Grant Avenue

Oklahoma City 3, Okla.
425 E. Hill St.

Omaha 3, Neb.
4469 Farnam Street

Philadelphia 6, Pa.
5th and Locust Streets

Pittsburgh 12, Pa.
101 Sandusky Street

Portland 9, Ore.
630 N. W. 10th Avenue

St. Louis 2, Mo.
305 South Broadway

Salt Lake City 11, Utah
160 Social Hall Ave.

San Francisco 24, Calif.
6025 Third Street

Tulsa 4, Okla.
1132 South Lewis Avenue

US RUBBER

Mechanical Goods Division

United States Rubber

Add Automation

Using special modification of standard machinery brings automation within reach of all

YOUR standard, precision boring machine can be made automatic by the addition of inexpensive, automatic components. One example (shown in the illustration) uses a specialized loader, an unloading chute and an expansion air chuck with ejection pins.

Automotive — Ex-Cell-O Corp., Detroit, recently adapted a standard 2112-B boring machine for automatic production of a steel sleeve for an automobile oil pump drive. Two grooves are plunge cut into the part. Rate: 250 pieces an hour.

ADAPTATION

. . . makes a standard into an automatic

Sleeves are placed in a vertical chute where a loading arm picks them up, turns approximately 60 degrees and places them on the air chuck. After the cut, the sleeves are ejected onto an inclined chute. The chute can be fed into a transfer-type machine for subsequent operations.

Approach — Two objectives are served by this type of adaptation: 1. Savings in production costs. 2. Transition from the older, and slower methods is smoother (investment is more easily controlled). In addition, individual units can be expanded into a battery of automatic machines by joining them with transfer mechanisms.

Handling on the Hot Spot

Riding high on the automation boom, material handling finds itself facing a continuing challenge. It must keep up with the ever-increasing production rates of machines

"AS THE industrial demand for automated production lines increases, the necessity for greater co-operation between machine tool builders and conveyor or transfer builders becomes quite apparent."

The man who spoke those words, R. L. Palmer, engineering department, Jervis B. Webb Co., Detroit, hinted at what may be the most significant behind-the-scenes development in material handling: Automation is the greatest flagbearer the material handling industry has ever had.

Speaking at the recent Westinghouse Machine Tool Electrification forum, Mr. Palmer said that although machine tool builders have done much to perfect handling of parts while they're in the machines, there's a great deal left to be done between the machines. In this area, he feels part of the responsibility for efficient, economical handling rests on the machine tool builder.

Six Points—Mr. Palmer told the builder-engineers that they could look for these six benefits from good handling between automatic machines:

- Increased production rates.
- Reduced in-process inventory.
- Reduced per-unit space requirements.
- Lower per-unit labor content.
- Less damage to parts in process.
- Better product uniformity.

Key Role — At times, material handling has had to struggle to be considered as something other than a necessary evil. That's no longer true, especially in the automated plant. Handling has arrived as a full-fledged production operation.

Raised Sights

Both machine builders and material handling equipment makers will be forced to shoot for new goals in handling speed and efficiency. Ceramic cutting tools are helping to push up the limits.

Also speaking at the Westinghouse forum, H. B. Friberg, chief engineer, machine design, National Automatic Tool Co. Inc., Richmond, Ind., said it will take efficient work-loading systems to enable machines to produce according to their inherent capacity, rather than by the rate at which parts can be loaded and located.

Challenge — As ceramics move into production, taking along their inherent ability to cut at superspeeds, the challenge to keep up falls in the lap of material handling. Limitations of handling will, in some cases, preclude the economics of going to faster cutting.

L. M. Cole, general sales manager, Warner & Swasey Co., likens the situation to a plane trip. It may take 3 hours to go from downtown Cleveland to downtown Detroit. Only 40 minutes of the time is spent in the air. The rest is used in getting to and from airports.

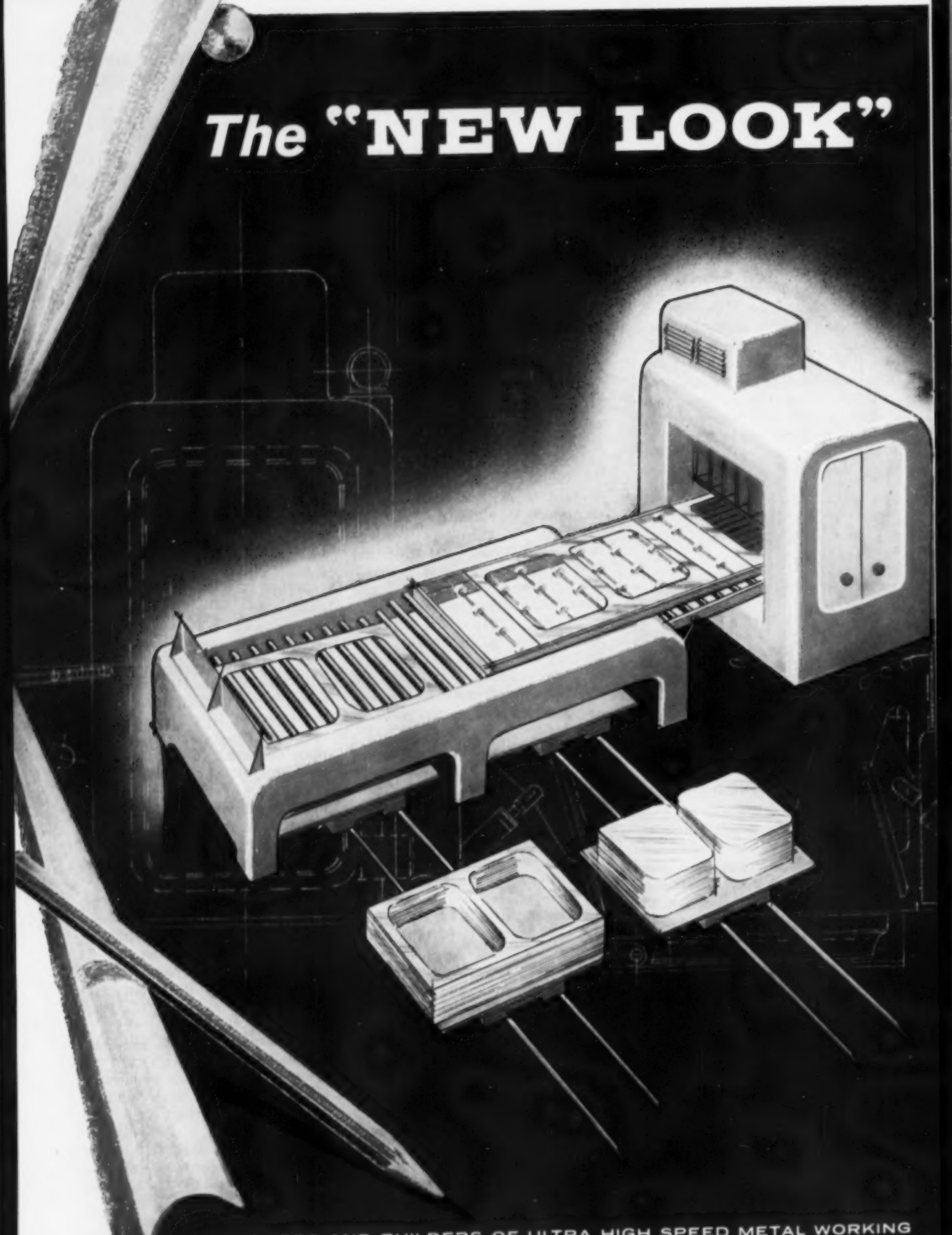
If you cut the flying time in half with superspeed planes, your total time is still about 2 hours and 38 minutes.

The relationship between metalworking and part-moving times puts the spotlight on handling. Handling no longer must sell itself as an important phase of manufacturing. Now it's being challenged to stay ahead of other phases.

Mr. Palmer feels this is a joint responsibility. "Working together," he says, "the builders of machine tools and work handling equipment can bring about real progress."

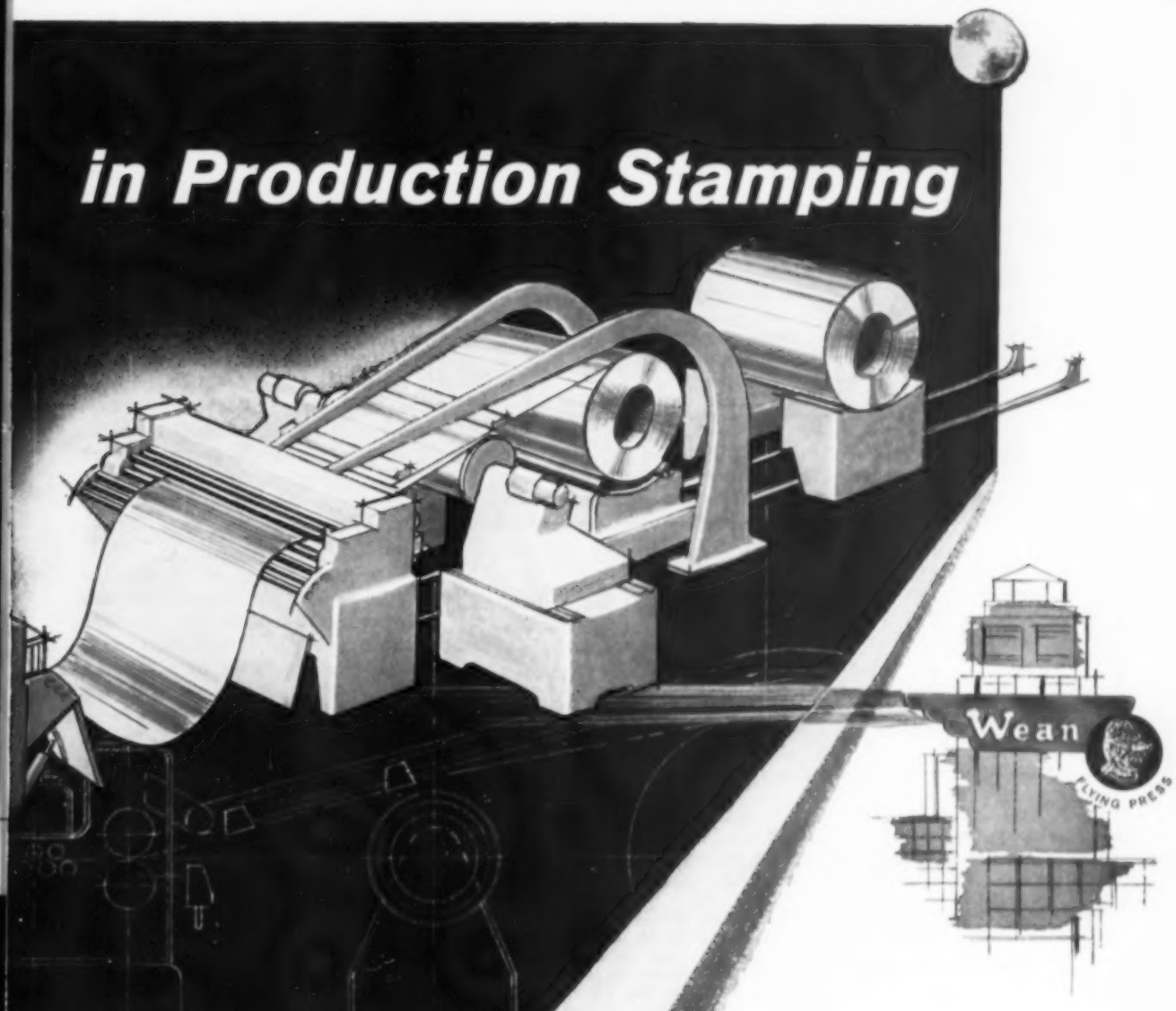
You'll find further evidence of concern for greater co-operation in handling on page 106 of this issue of STEEL.

The "NEW LOOK"



DESIGNERS AND BUILDERS OF ULTRA HIGH SPEED METAL WORKING

in Production Stamping



AUTOMATION for the pressroom is just around the corner according to a number of the nation's leading press experts who have studied the revolutionary "Flying Press" approach recently announced by the Wean Equipment Corporation.

Taking a coil of steel directly from the mill, the Wean Flying Press Line decoils, levels, measures, blanks, sorts, counts and piles the finished piece on trans-car ready to be rolled to the next operation — at a speed heretofore considered unobtainable.

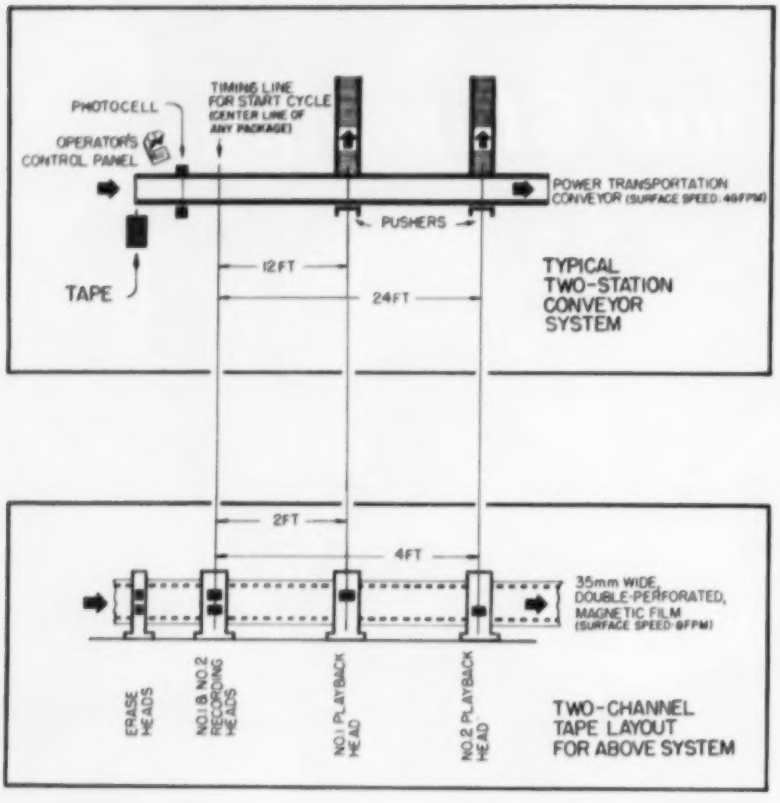
Present engineered lines will handle coils up to 72 inches in width — cutting lengths from 12 inches to 8 feet.

Some of the more outstanding features of the line: floor mounted for quick, inexpensive installation with built-in die loading mechanism; a new coil sticker that eliminates manual threading; a high speed, non-scratch piling mechanism and several newly developed "automated" devices that assure a continual flow of metal through the press.

If low cost, mass production stamping appeals to you, why not contact a Wean Equipment engineer for full particulars? Write direct or call the Wean office in Chicago, Detroit or Newark, N. J.

Wean
EQUIPMENT

EQUIPMENT CORPORATION
CLEVELAND • CHICAGO • DETROIT • NEWARK, N. J.
Cable: WEANCOR



Tape Directs the Conveyor

By DONALD C. MULLER
Chief Design Engineer
A. J. Bayer Co.
Los Angeles

and

S. M. ALDER
Sales Engineer
Minnesota Mining & Mfg. Co.
St. Paul

WAREHOUSE HANDLING time has been cut drastically with a magnetic tape-controlled conveyor system that automatically distributes packages in any desired sequence. Initial installations have as many as 20 discharge stations.

Already in operation at seven Air Force bases, the automatic system has reduced the time necessary to handle a typical warehouse job from 40 hours to 4 or 5.

Application—Called ASSET—Automatic Selected Station Electronic Timer—the system is designed for use on transportation-discharge conveyors (shunting off packages, cartons, boxes or crates from a main conveyor to a series of branch conveyors).

Example: A main transportation conveyor may carry incoming boxes down one side of a warehouse past various bays and storage areas for different types of goods. At each bay is a shorter discharge conveyor, branching off at 90 degrees from the main conveyor into the bay.

One-Man Job—ASSET makes it possible for an operator at the loading end of the conveyor to grade a package by type of goods as it approaches, decide to which warehouse area it should go and push a selector button for that discharge point.

The system takes over when the moving package interrupts the beam of a photoelectric cell at the side of the conveyor near the operator. It then routes each package to the appropriate branch conveyor.

How It Works—The electronic timer is essentially a magnetic tape scale model of the conveyor layout. Representing the belt-type conveyor is a loop of 35-mm, double-perforated magnetic film.

Conveyor and tape are synchronized, but the tape is geared down 6:1 so that a conveyor speed of 48 fpm is represented by a tape speed of 8 fpm. The distance from the photocell to the farthest branch conveyor determines the length of tape.

Representing a package placed on the conveyor is an impulse recorded on the tape. A branch conveyor, a specific distance from the main conveyor, is represented on tape by a playback, or pickup, head mounted a proportionate distance down the tape from the recording head.

Multiple Heads—To enable the system to handle more than one discharge conveyor, five recording heads in a bank—one head for each conveyor—are lined up across the tape. Each of the five heads has its own track with an unrecorded space between the parallel tracks. Corresponding playback heads for each conveyor are mounted in the respective channels.

If more than five discharge conveyors are to be handled, a second bank of five recording heads is used. This bank is slightly offset, so the heads record in the space between the first five channels. If more than ten stations are to be handled, a second or third tape layout is added to the panel.

Sequence—The operator pushes a selector button for the particular discharge conveyor. This energizes the recording head in that conveyor's channel. As the package reaches the timing line, an impulse is automatically recorded on the tape.

As the package progresses down the main conveyor toward its discharge point, the impulse on the tape moves toward its playback head. When the impulse arrives, it trips a relay which operates a pneumatic pusher that sweeps the package—at that instant centered at its discharge point—onto the discharge conveyor.

ASSET was developed by A. J. Bayer Co., Los Angeles. It uses "Scotch" brand magnetic film, made by Minnesota Mining & Mfg. Co., St. Paul.

This is why you need only ONE master!

This air gage system is basically different from that of other air gages. One side of this system—the measuring side — is *rigidly fixed*. There is no adjustment and measurements *cannot vary*. Hence, the gage *is linear* over its long range and *can be calibrated* and *set with a single master*. Because of this, the Dimensionair is an air gage of dependable stability. *It cannot drift . . . throughout its long range.*

The balancing side of the system has a *single* zero adjustment. This enables you to set the Dimensionair positively and instantly to zero, *with a single master*. Excess bits of dirt, oil or water *do not* affect the Dimensionair any more than they do other air gages. *But*, some gages are too *insensitive* to show up such failure.

If you are familiar with ordinary air gages requiring two masters, you'll appreciate the advantages of using *one* master. You *save half the cost of masters . . .* set the gage easily and simply . . . experience, for the first time, the feeling of *dependable, non-drifting,* precise measuring.

The Dimensionair's basic system enables it to be *combined directly* with electrical and electronic units as used with *Machine Control* and *Automatic Sorting Gages*. This obviates the accessory equipment required by other air gages and permits higher speeds, greater precision — with assured stability. It is much easier to set the gage to the spread between electrical contacts; e.g. the spread between the machine's fine feed and the finish feed. Adjusting to zero *does not* affect this spread setting.

Check these facts for yourself. Have a Dimensionair installed in your plant now.

Compare it with any other air gage you may already own or any you may wish to have brought in for comparison.

FEDERAL PRODUCTS CORPORATION
6215 Eddy Street • Providence 1, R. I.

1. **One master, only, required.**
2. **Constant, positive accuracy.** Balanced air system positively controlled. It can't drift.
3. **Dependable stability.** Unaffected by surges, or changes in air pressure.
4. **Linear, direct reading scale.** Not a "go" and "no go" gage. Positively controlled accuracy permits calibrated linear scale having graduations of **known value.**
5. **Longer range per magnification** .003" and .0015", on 2,500 to 1 and 5,000 to 1 respectively, takes care of 90% of gaging requirements and provides the following advantages:
   Greater Plug Clearance.
   Longer approach range.
   Longer gage head wear.
   Greater jet protection.
6. **Fast, easy setting.** Positive setting in ten seconds.
7. **Easiest to install.** Connect directly to air supply. Filter already attached. Pressure regulator assures ample protection — only 40 lbs. pressure required.
8. **Less maintenance.** Gage system better protected. Larger jets stay clean. Maintenance negligible if properly installed.
9. **Easily adaptable to special requirements.** May be combined with electrical and electronic units for **automatic gaging and machine control.**

Ask FEDERAL *First*

FOR RECOMMENDATIONS IN MODERN GAGES . . .

Dial Indicating, Air, Electric, or Electronic—for Inspecting, Measuring, Sorting, or Automation Gaging

Federal's solution to the cost of gaging:
Impartial Gage Selection
Engineering Follow-Through
Everything In Gages

mail coupon today

Federal Products Corporation
6215 Eddy Street, Providence 1, R. I.

We'd like to test a Dimensionair in our plant.

Company Name .....

Your Name .....

Title .....

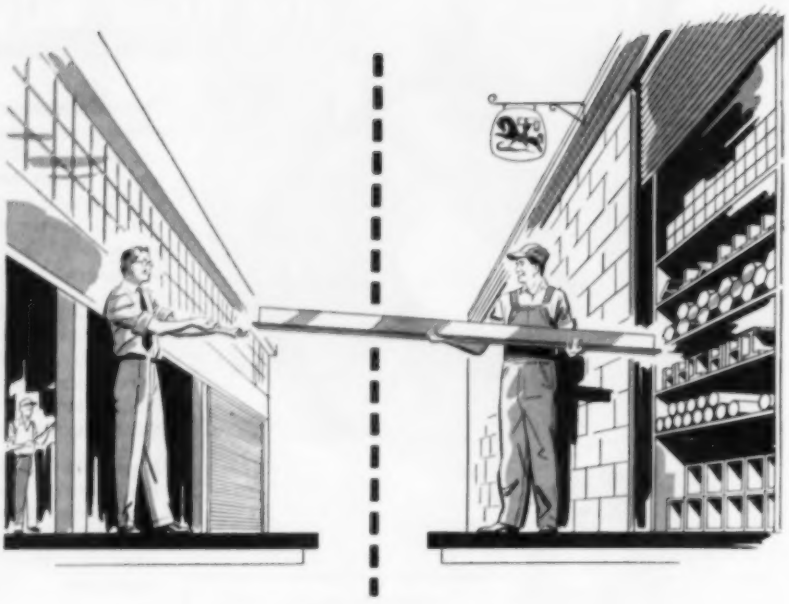
Address .....

REYNOLDS DISTRIBUTORS

ALABAMA
Southern States Iron Roofing Co., Birmingham
CALIFORNIA
Braico Metals, Inc., *Los Angeles
Clingan & Fortier, Inc., Fresno, *Los Angeles, Sacramento, San Francisco and Vernon
Parry Kilsby, Inc., (Tubing & Pipe) *Los Angeles
Pioneer Aluminum Supply Co., *Los Angeles
Turner Metal Supply Co., (Wire, Rod, Bar) *Huntington Park
United States Steel Supply Div., Los Angeles
COLORADO
M. L. Foss, Inc., *Denver
CONNECTICUT
American Steel & Aluminum Corp., *Hartford
Peter A. Frasse & Co., Hartford
Scovill Mfg. Co., (Wire, Rod, Bar) *Waterbury
FLORIDA
Southern States Iron Roofing Co., Jacksonville, Miami, Orlando and Tampa
GEORGIA
Southern States Iron Roofing Co., Atlanta and *Savannah
ILLINOIS
Aluminum Distributors, Inc., *Chicago
J. O. Braun Co., (Architectural only) *Chicago
Joseph T. Ryerson & Son, Inc., Chicago
Scovill Mfg. Co., (Wire, Rod, Bar) Chicago
United States Steel Supply Div., *Chicago
Benjamin Wolff & Co., *Chicago
INDIANA
W. J. Holliday & Co., *Indianapolis
Kaole Steel Corporation, Elkhart
United States Aluminum Co., (Architectural only) *South Bend
KANSAS
Industrial Metals, Inc., Wichita
KENTUCKY
Cobb Sales Co., (Wire, Rod, Bar) *Louisville
Southern States Iron Roofing Co., Louisville
MARYLAND
Clendenin Bros., Inc., *Baltimore
MASSACHUSETTS
Jos. T. Ryerson & Son., Inc., Boston
MICHIGAN
Kaole Steel Corporation, *Detroit and Grand Rapids
McDonnell Bros., Inc., (Architectural only) *Detroit
Meier Brass & Aluminum Co., *Detroit
MINNESOTA
MacArthur Co., (Architectural only), *St. Paul
United States Steel Supply Div., St. Paul
Vincent Brass & Aluminum Co., *Minneapolis
MISSOURI
Industrial Metals, Inc., *Kansas City and St. Louis
United States Steel Supply Div., St. Louis
NEW JERSEY
Edgcomb Steel and Aluminum Corp., *Hillside
Peter A. Frasse & Co., Lyndhurst
Mapes & Sprowl Steel Co., *Union
Ray Miller, Inc., (Tubing & Pipe) *Newark
NEW YORK
J. O. Braun Co., (Architectural only) New York
Edgcomb Steel and Aluminum Corp., Hillside, N. J.
Peter A. Frasse & Co., Buffalo, *New York, Rochester Syracuse
Mapes & Sprowl Steel Co., Union, N. J.
Ontario Metal Supply, Inc., (Wire, Rod, Bar) *Rochester
NORTH CAROLINA
Southern States Iron Roofing Co., Raleigh
OHIO
Kaole Steel Corporation, Cleveland
Mutual Manufacturing & Supply Co., *Cincinnati
Varys Brothers, Inc., *Columbus
OREGON
Clingan & Fortier, Inc., Portland
PENNSYLVANIA
Athos Steel Service Co., *Philadelphia
Peter A. Frasse & Co., Philadelphia
Merchant & Evans Co., *Philadelphia
Penna. Industrial Supplies Co., Inc., *Pittsburgh
RHODE ISLAND
The Congdon & Carpenter Co., *Providence
SOUTH CAROLINA
Southern States Iron Roofing Co., Columbia
TENNESSEE
Southern States Iron Roofing Co., Memphis and Nashville
TEXAS
Allied Metals Inc., *Houston
Monarch-Lanoir Mfg. Co., Dallas, Harlingen, *Houston, Lubbock, San Antonio and Temple
Vinson Steel and Aluminum Co., *Dallas
UTAH
Salt Lake Hardware Co., *Salt Lake City
VIRGINIA
Southern States Iron Roofing Co., Richmond
WASHINGTON
Clingan & Fortier, Inc., Seattle
WISCONSIN
Wisconsin Bridge & Iron Co., (Architectural only), *Milwaukee
Benjamin Wolff & Co., Milwaukee
TERRITORY HAWAII
American Factors, Ltd., *Honolulu
*Indicates main office

Look Under "Aluminum" in Your Classified Telephone Directory

3-29-54



Your Reynolds Distributor is right next door—

for prompt service and delivery

You don't need to maintain large inventories when you rely on Reynolds Distributors to keep your production on schedule. Aluminum shipments from nearby warehouses can be scheduled as needed, saving money and space that can be put to productive use. Prompt, dependable deliveries are assured because service is your distributor's business. This service will help you solve many problems and save you money. *Reynolds Metals Company, Louisville 1, Kentucky.*

Call your nearest Reynolds Distributor, listed in the adjoining column, for his aluminum stock list and assistance on your problems.

The Finest Products Made with Aluminum are made with REYNOLDS ALUMINUM

Material Handling

Here are some of the 1196 pieces of equipment to be exhibited at the handling show

Industrial Pump

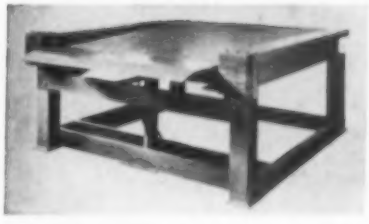
Moyno pumps, operating on the "progressing cavity" principle, will handle anything from free-flowing liquids, nonpourable pastes and substances containing relatively large particles.

Pumping action can be compared to that of a screw-type conveyor. A helical rotor, turning within a fixed stator with a double internal helical thread, forms cavities which progress toward the discharge end of the pump, carrying the material being handled.

The Moyno is available in a wide range of construction materials, making it suitable for many difficult applications. Capacities go up to 400 gpm. Robbins & Myers Inc., Springfield, O. (Booth 1417)

Hydraulic Dock Levelers

These assembled units are ready to be placed in front of a dock. The model illustrated has a capacity of 20,000 lb. It is 6 ft x 8 ft 8 in. Instant raising or lowering is controlled from a push-button station.

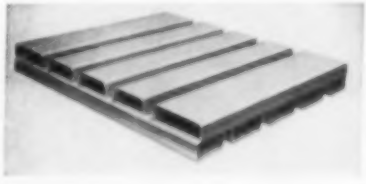


The leveler has a manual floating feature, providing a smooth, level and substantial ramp which automatically compensates for spring deflection of the truck bed during freight transfer. Rowe Methods Inc., 2534 Detroit Ave., Cleveland 13, O. (Booth 301)

Corrugated Pallets

Here is a reversible, double-face, cross-channel pallet that will handle nearly any load to fork truck capacity. Forks can be inserted in the flats between corrugations on each of the four sides.

A similarly constructed pallet has been designed for four-way fork truck and two-way hand pallet truck handling. The pallet can be made of steel or aluminum. Union Metal Mfg. Co., Canton, O. (Booth 608)



Truck

The Xpediter replaces the conventional two-wheel hand truck in receiving, shipping and production departments. Powered by a 7½-hp, single-cylinder, 4-cycle gasoline engine, it has a carrying capacity of 600 to 800 lb.

The Model 301 fork truck has a standard 16-in. lift for loading onto pallets and skids. Model 201 barrel handler (photo) has a 16-in. lift which permits loading 55-gallon drums on pallets for stacking and storage.

Also to be exhibited is a new (one-man) personnel carrier (powered by a 12-volt battery) and matching trailer. It speeds up de-

NOW! a new source
J.L
You can count on
J.L GALVANIZED SHEETS
to safeguard the quality of your work

for galvanized sheets

Now sheet metal users can look to a new, dependable source of galvanized sheets. Jones & Laughlin Steel Corporation is putting more than 100 years of steelmaking experience behind its new facilities for the production of high grade galvanized sheets.

New J&L Galvanized Sheets carry on the J&L reputation for quality steel. Produced with uniform ductility, flatness, and surface finish, they are typical of J&L ability to produce to exacting specifications accurately and faithfully.

Galvanized by the proven Sendzimir process, J&L Galvanized Sheets have a tight uniform coating that resists cracking and flaking, even during severe forming and drawing operations.

J&L Galvanized Sheets are produced with a high-lustre finish that creates eye appeal and customer acceptance for your finished products.

The next time you order, remember—J&L Galvanized Sheets are available in both coils and cut lengths to fit your continuous operations. They work up easily—can be formed, rolled, drawn and cut to your satisfaction.

Available in a range of gages and widths to meet your requirements. Get complete details today.

J&L STEEL

Jones & Laughlin

STEEL CORPORATION · PITTSBURGH

JONES & LAUGHLIN STEEL CORPORATION
404 Gateway Center, Pittsburgh, Pa.

☐ Please send me more information on J&L Galvanized Sheets.
☐ Have your representative call.

NAME _____

TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

livery of mail and emergency parts in the large area plant. Kalamazoo Mfg. Co., Kalamazoo, Mich. (Booth 1034)

Hose Fitting

The rubber cover on the No-Skive hose does not have to be removed before it is attached to a fitting.

The lead thread of the socket cuts through the outer cover, which permits the following threads to engage wire braid in a grip that holds beyond hose bursting pressures.

The rubber is compressed between the threads of the socket and acts as a vibration dampener. Tube & Hose Fittings Division, Parker Appliance Co., 17325 Euclid Ave., Cleveland 12, O. (Booth 1102)

Fork-Lift Trucks

The Clarklift line is new from the wheels up. Trucks have as standard equipment: Twelve-volt electrical systems, fully automatic transmissions, emergency fuel tanks, foam rubber seats and automobile-like controls.

Exclusive features include self-adjusting brakes, a balanced swing-up hood, solid tire models with drive and steer wheels of the same diameter, combination lift-tilt controls on the steering column, optional radiator screens for dusty operations and all-purpose deep-tapered forks.

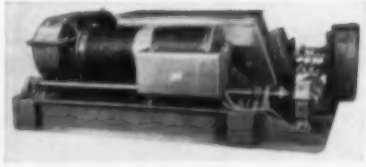
Included in the line are pneumatic-tire models for all-weather outside work. Gas models with capacities from 2000 to 5000 lb are available; electric and gas models of higher capacity will be added shortly. Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich. (Booth 1426)

Drag Conveyor

A working model of the Towveyor, a chain-in-floor drag unit, shows how it works in plant warehouses and rail or truck terminals. Jervis B. Webb Co., 8951 Alpine Ave., Detroit 4, Mich. (Booth 110)

Trolley Hoist

Type C-10 is a trolley hoist for double I-beam crane mounting. Designed for floor or cab control, the hoist is powered by a 25-hp, slip ring motor. The trolley motor (minimum rating of 3 hp) is the same design. Both are totally enclosed and rated for 30-minute duty.



Controls are the full magnetic type. Both the hoist and the trolley have variable speed or automatic accelerating control. Dynamic lowering is optional. The new hoist is available in models of 10, 15 and 20-ton capacity. Robbins & Myers Inc., Springfield, O. (Booth 1417)

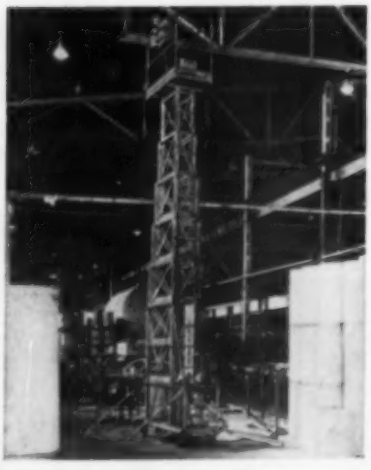
Elevating Truck

Originally developed for the installation and servicing of room air conditioners, this machine has proved useful in handling instruments and die blocks.

Features: It folds into a compact unit for transporting (photo shows truck folded); it can be used as a conventional two-wheel hand truck; it is furnished with stair-climbers that permit conveying loads up or down stairs without damage to the load or stairs; it will elevate up to 43 in. and at that height provide a suitable platform from which to transfer or service the load. Fairbanks Co., 393 Lafayette St., New York 3, N. Y. (Booth 116)

Platform Lift

The Lift Master is a hydraulic, telescopic platform unit which is mobile. It is designed for interior and exterior repair and maintenance. Only one operator is needed. It can be stopped and locked in position at any height between 9 and 35 ft.



Safety features include dual controls in the base and on the platform, 10-ft 9-in. outriggers that guarantee secure footing on floor

Steelmasters for 130 years

IRON PRODUCTS
"Swede" Pig Iron

STEEL PRODUCTS
Plates (sheared)
A. W. Dynalloy (high strength steel)
Hot Rolled Sheets
Hot Rolled Strip
Cold Rolled Sheets
Cold Rolled Strip

ROLLED STEEL FLOOR PLATE
A. W. Algrip abrasive
A. W. Super-Diamond pattern

A. W. CUT NAILS
Standard & Hardened

MINE PRODUCTS
Iron Ore Concentrates
Iron Powder
Crushed Stone
Grit
Sand & Engine Sand

COKE
Foundry, Industrial & Metallurgical

COAL CHEMICALS
Ammonium Sulphate
Benzol
Toluol
Xylol
Naphthalene
Sodium Phenolate
Tar Bases (Pyridene)
Solvent Naphtha
Crude Still Residue

PENCO METAL PRODUCTS DIVISION
Steel Cabinets, Lockers & Shelving

"Lots of trouble to get good product"

Said by the founder of Alan Wood Steel—James Wood—over a hundred years ago, that statement set a manufacturing standard for five generations of steelmaking Woods. Today, as then, the ". . . trouble to get good product" includes modern equipment, facilities, research, development and determination. Accepting that "trouble" has led to a nearly $50,000,000 expansion expenditure in ten years that has helped us supplement our greatest selling advantages—"good products" and individualized attention to orders by a compact, fully integrated, flexible steel mill.

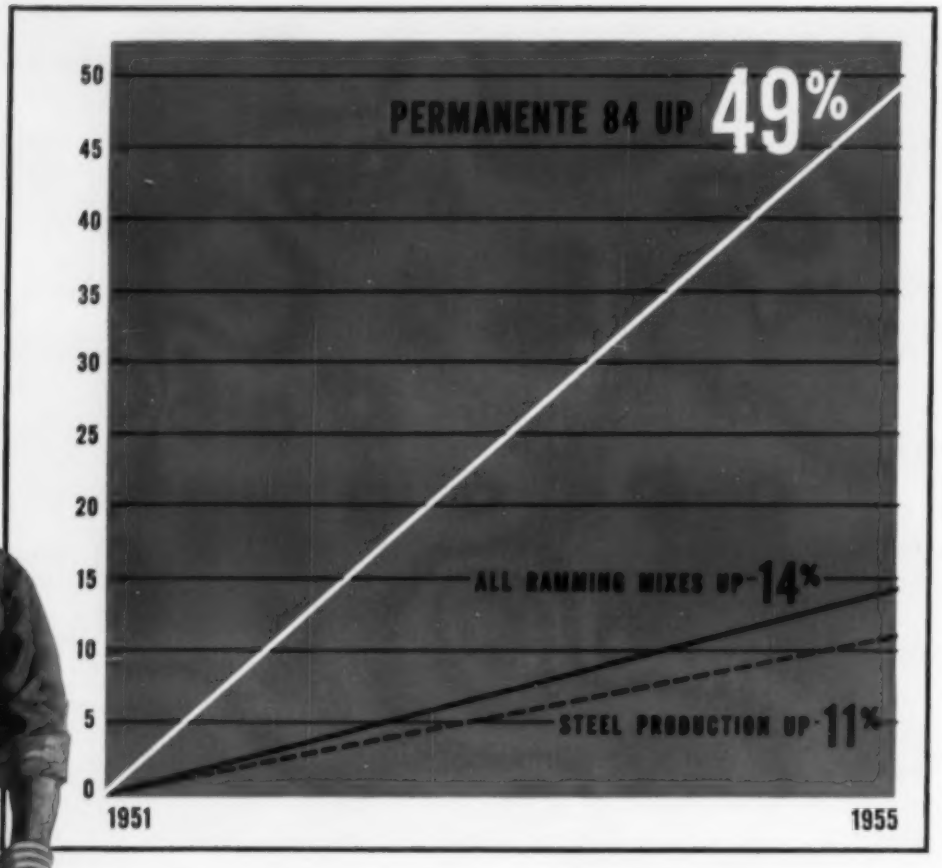
For detailed information on any Alan Wood product, write Marketing Division—Department AW-51.

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

PHILADELPHIA, PA.
IVY ROCK, PA.
SWEDELAND, PA.
DOVER, N. J.
OXFORD, N. J.

DISTRICT OFFICES AND REPRESENTATIVES:
Philadelphin—New York—Los Angeles—Atlanta—Boston—Buffalo—Cincinnati—Cleveland—Detroit—Houston—Pittsburgh—Richmond—St. Paul—San Francisco—Seattle.
Montreal and Toronto, Canada: A. C. Leslie & Co., Limited.



Why this growing preference for Permanente 84 Ramming Mix!

As you can see from the chart above, sales of all ramming mixes to steel producers increased only 14% during the five year period ending December 31, 1955.

But during this same period, sales of Permanente 84 Ramming Mix increased *a whopping 49%*!

Why is Permanente 84 increasingly preferred by leading steel producers?

Briefly, here are the reasons:

Permanente 84 reduces the cost of maintaining furnace bottoms and banks. Repairs made with Permanente 84 stay put! Down time for hot-repairs is reduced because repairs made with Permanente 84 last longer. Steel production goes up—costs come down. Ideal for hot patching both open hearths and electric furnace banks and bottoms.

Order Permanente 84 now, and get extra steel tonnage at lower cost.

Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway,* OAKLAND *12, California . . . 3 Gateway Center,* PITTSBURGH, *Pennsylvania . . . 618 Calumet Building, 5231 Hohman Avenue, Hammond, Indiana* (CHICAGO).

KAISER **Kaiser Chemicals**

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

or ground, steel tubing rail and mid rail, plus a special safety toeboard on the 2-ft 4-in. x 4-ft platform. Four heavy - duty roller chains support each section. Allied Mfg. & Sales Co., 3101 W. Grand Ave., Chicago 22, Ill. (Booth 1402)

Lift Truck

The operating advantages of the Hyster Monomast now are available on a pneumatic-tired truck, the Hyster QN-20, which has 2000-lb capacity at 24-in. load centers. The truck is ideal for inside and outside work.

Advantages, stemming from a single upright mast include faster load placement, reduced driver fatigue and greater safety. The lift truck can work rapidly in narrow aisles and crowded warehouse areas.

The QN-20 is powered by a heavy-duty, air-cooled gasoline engine. LP-Gas conversion kits are available. Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg. (Booths 1116, 1422)

Fork Lift Truck

FTDX 40-24 is a diesel truck for hazardous work. It is equipped with static cushion tires, torque converter, sparkproof forks, hydraulic starter and actuator, water manifold and water muffler.

The truck can be operated safely in explosive and other dangerous areas. It has no electrical or

ignition system. Capacities range from 3000 to 10,000 lb. Buda Division, Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. (Booths 1612, 1614, 1626)

Gasoline, Diesel Engines

Six new gasoline engines with overhead valves and six new direct-injection diesels have been added to this line. All are built in matching and interchangeable 4 and 6-cylinder designs. Range: 50 to 131 hp.

In addition to being interchangeable as units—the gasoline for the diesel and the diesel for the gasoline engine—many common components are used in both lines. Hercules Motor Corp., Canton, O. (Booth 510)

Flat-Bed Truck

Compared with wood-and-steel trucks of equal size and capacity, this unit's all-aluminum construction cuts weight as much as 80 per cent. Aluminum also eliminates painting, difficult cleaning and moisture-absorption problems typical of wood and steel.

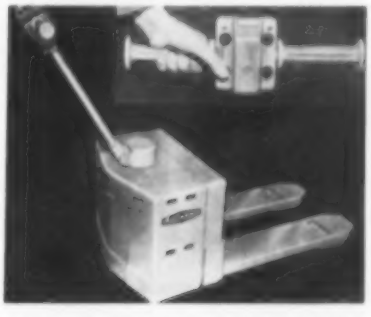
Bed construction of high-strength aluminum extrusions permits the entire bed to act as a spring, eliminating sharp shocks to loads and casters. The heavy-duty aluminum swivel casters, with oversize roller bearings, eliminate binding, assure easy swiveling.

Trucks come in 40 standard sizes, from 24 x 30 in. to 48 x 72 in., with 6, 8, 10 or 12-in. plastic wheels, or aluminum wheels with molded-on-rubber or zero-pressure tires.

Other new products to be exhibited will include dockboards, hand trucks and pallet dollies. Materials Handling Division, Magnesium Co. of America, East Chicago, Ind. (Booths 1218, 1335)

Electric Truck

Compactness is the main feature of this new "walkie" truck. Overall length is only 20½-in. greater than the load length. New safety features have been provided to protect the operator. For instance, a safety button on the end of the handle instantly puts the truck into reverse when it presses against the operator.



The power pack consists of four automotive-type batteries. This gives 24-volt operation with no resistance loss in second and third speeds. Other features: Three travel speeds; fingertip controls for travel, lift and lowering; easy maintenance; smooth pallet entry and lightweight construction. Raymond Corp., 91-139 Madison St., Greene, N. Y. (Booths 1122, 1228)

Bulk Truck

The Load-Lugger has a flat-bed truck body and two hydraulically operated lifting arms.

The arms are used to handle detachable containers with capacities ranging from 1½ to 14 yards. Weights go to 18,000 lb.

Three types of containers are available. Model HS has an open

top. Model AB2 is a fully enclosed container used for handling bulk materials. Sludges, liquids and powders are handled in a closed container, Model LS, with seals on the doors. Ingersoll Kalamazoo Division, Borg-Warner Corp., Kalamazoo, Mich. (Booth 1312)

Industrial Truck Batteries

The capacities of two batteries, type HA and HB, have been increased at least 10 per cent. HA is a 66-amp-hr battery in a standard, 60-amp-hr case. HB is a 125-amp-hr battery in a 110-amp-hr case.

Longer plates and less sediment space account for beefed-up power. Plate shedding is virtually eliminated. C & D Batteries Inc., Washington & Cherry Sts., Conshohocken, Pa. (Booth 1444)

Dispatch System

The system uses an overhead conveyor of the power pusher type with a parallel gravity or dead rail. With selective type carriers or trolleys, power switches and other mechanisms, it is possible to hold parts in storage and feed them into production as required.

The system uses ceiling space or other dead space for storage. Production parts or assemblies can be routed from different parts of a plant, including dead storage lines, by simply presetting the selector carrier head. Richards-Wilcox Mfg. Co., Aurora, Ill. (Booth 402)

Electric Fork Lifts

A new line of rider-type, electric fork trucks — the Loadmaster Model "R"—is available in 1500, 2000, 3000 and 4000-lb capacities. The trucks will right-angle stack 40-in.-long loads in aisles only 114⅝-in. wide and 48-in.-long

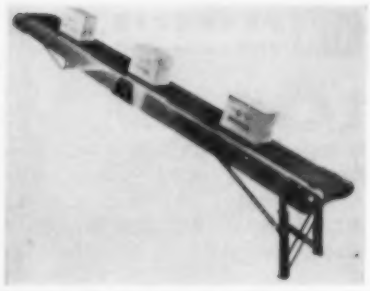
loads in aisles only 120⅝-in. wide. Turning radius is 62¼-in.

Power is supplied by a compound-wound traction motor through a full gear drive. The truck has four speeds forward and reverse, with timed acceleration and dynamic braking.

The elevating assembly consists of a reinforced formed channel outer mast and a rolled I-beam inner mast. A new high-pressure hydraulic system gives faster lift speeds (lift speed on the 3000-lb model is 48 fpm empty and 38 fpm loaded). Lewis Shepard Products Inc., Department R-20, Watertown, Mass. (Booth 228 and 1012)

Belt Conveyor

A lightweight, highly maneuverable unit with a total distributed load capacity of 250 lb, this belt conveyor is ideal for use on stairways, as a booster on a gravity conveyor line, for stacking and for loading and unloading trucks and rail cars. The belt does not



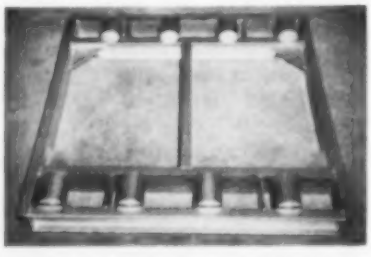
touch the floor in any inclined position.

The conveyor is of aluminum truss construction. It is 16 in. wide. Lengths are 6 to 20 ft. Weight ranges from 145 to 225 lb. The 10-in. wide belt is of nonslipping, three-ply duck and moves at 65 fpm. Each end has a take-up adjustment. Colson Corp., Elyria, O. (Booth 1021)

Pallet Dollies

Of all-magnesium construction, these dollies provide maximum strength at minimum weight. They facilitate quick, efficient manual positioning for faster, more economical material flow in freight car loading and trucking operations.

The dollies are fabricated of welded magnesium channels and are fully stress relieved. Other features: Rounded corners and 3½-in.-diameter rollers with ball bearings and steel axles. Roller spacing may be even or staggered.



Pallet dollies are available in six standard sizes and in capacities of 2000 or 4000 lb. Magline Inc., 1900 Mercer St., Pinconning, Mich. (Booth 101)

Hand Hoists

Zephyr hoists are available in capacities to 6 tons. Light and compact, they can be carried on the shoulder to practically any part of the plant. They are easy

Avoid unnecessary machining–

BY USING Edgewater

ROLLED STEEL RINGS

Rolled accurately to size and shape from solid blocks of steel, Edgewater Rolled Steel rings need a minimum of machining. The saving in time and material can be very substantial, especially when complex cross-section shapes are required. We will be glad to help you make designs that will gain for you the maximum advantages of the Edgewater process. Diameters, 5 inches to 145 inches.

SEND for free bulletin describing the Edgewater rolling of weldless steel rings.

Edgewater Steel Company
PITTSBURGH 30, PA.

to carry up a ladder, easy to operate in tight corners.

Completely enclosed, sealed construction contains lubricants. Gearing is a center planetary system using a modified involute stub form. Chester Hoist Division, National Screw & Mfg. Co., Lisbon, O. (Booths A1016, 1018)

Cruiser Crane

This unit is best suited for odd-jobs around plants, in warehouse and storage yards and in large area installations where handling equipment must be shifted quickly from one assignment to another.

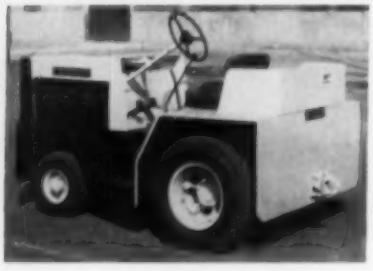
Both travel and work operations are handled from one station. One engine supplies all power. A 4-wheel-drive arrangement provides extra traction. Other features include power steering, air-hydraulic brakes and a standard torque converter.

The cruiser crane has a 15-ton lift capacity. Top travel speed is 21 mph. Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis. (Booth 1429)

Tractors

Redesigned "Huskie" tractors are rated at 3000 and 4000-lb drawbar pull; the "Super-Huskie" (see photo) is available in models rated at 4000 and 5000-lb drawbar pull.

All models use 6-cylinder gasoline or LP-Gas engines. The single plate, 10-in. clutch with 13-in. fluid coupling and syncromesh transmission has a provision for power takeoff.



Heavy-duty hydraulic, internal expanding brakes within the drive wheels will stop loads or hold them on inclines without strain on the tractor. Mercury Mfg. Co., 4044 S. Halsted St., Chicago 9, Ill. (Booth 1003)

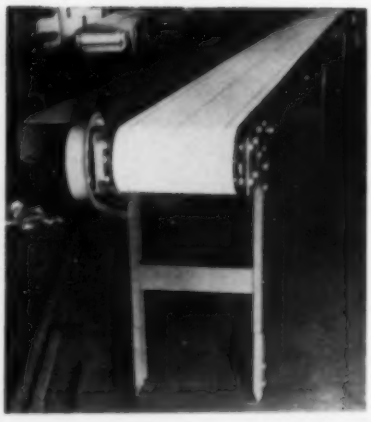
Steel Studs

Heat treated alloy steel studs made from SAE 4140 steel are used on flanged fittings and joints. They have continuous threads. The studs are adaptable for high temperature and high pressure service. Sterling Bolt Co., 363 W. Erie St., Chicago 10, Ill. (Booth 701)

Belt Conveyor

This light-duty, slide-bed conveyor travels at 25, 37½ or 50 fpm. Width of the belt can be 8, 12 or 16 in. Belt lengths of 10, 20, 30, 40 and 50 ft are available. Maximum load rating of a 10-ft belt model at 25 fpm is 25 lb per foot.

The belt conveyor is available

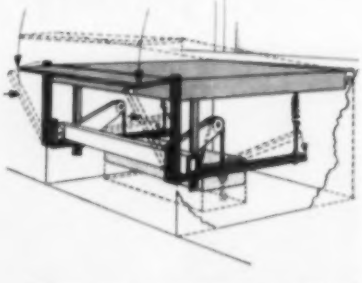


with no side leaves, or with leaves on one or both sides. A ¼-hp gearhead motor supplies the power. Island Equipment Corp., 27-01 Bridge Plaza North, Long Island City 1, N. Y. (Booth 1403)

Automatic Dockboard

The new series of Hi-Lo automatic dockboards provide simplified operation and installation. Features include dual operating arms and a crosstraffic lock and tilt adjuster.

Truck-actuated operating arms automatically adjust the dockboard to meet carrier bed levels. The entire operating mechanism is mounted on the pit crossbeam, eliminating special pit construction.



There are no power or control requirements. Models 6, 8 and 10 ft long are available for new or existing docks. Kelley Co. Inc., 316 E. Silver Spring Dr., Milwaukee 17, Wis. (Booth 512)

Trackmobile

Although similar in principle to previous models, the 3TM Trackmobile is heavier, larger and more powerful. Powered with a heavy-duty, industrial V-8 engine, the

Tape that holds in freezing cold!

So cold-resistant, it holds at 40° below . . . so wet-proof, it transmits less moisture than even a wax-impregnated carton. "Scotch" Brand Acetate Fibre Tape is tough, long-aging, dimensionally stable; meets government packaging specification JAN-P-127. 12 colors: red, green, orange, blue, orange-yellow, light green, yellow, light blue, white, black, silver, and gold, plus transparent. Ask your "Scotch" Brand Tape distributor about acetate fibre tapes, or send for folder described.

Always specify "Scotch" Brand, the *quality* tape . . . and stick with it!

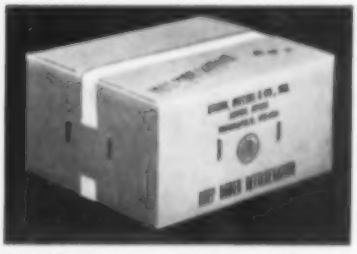
ACETATE FIBRE TAPE...*one of more than 300 pressure-sensitive tapes for industry, trademarked...*

REG. U.S. PAT. OFF.

SCOTCH BRAND

Look what you can do with it!

PACKAGE parts and products quickly, easily, with "Scotch" Brand Acetate Fibre Tape and Automatic Box Sealer S-70. Acetate fibre tape can be printed with sales message, if desired.



CLOSE cartons to be kept under refrigeration. "Scotch" Brand Acetate Fibre Tape No. 710 resists moisture and temperature changes; aggressive adhesive holds even at below freezing.

SEAL cartons against moisture with "Scotch" Acetate Fibre Tape No. 710. Adheres quickly and securely; forms a strong seal that resists abrasion and scuffing.

SEND FOR free folder describing remarkable physical properties of "Scotch" Brand Acetate Fibre Tape and giving valuable use suggestions. Write on your letterhead to "3M" Co., St. Paul 6, Minn., Dept. GK-56.

The term "SCOTCH" is a registered trademark of Minnesota Mining and Manufacturing Co., St. Paul 6, Minn. Export Sales Office: 99 Park Ave., New York 16, N.Y. In Canada: P.O. Box 757, London, Ontario.

Now-COLD BENDING THE "PINES-WAY" PRODUCES MORE ACCURATE AUTOMOBILE FRAMES

View of Pines Production Bender, one of 28 in large plant, forming 5th bend in frame side rail. Tube is 4"x4½"x.090 formed to a 38° angle on a 17⅛" I.R.

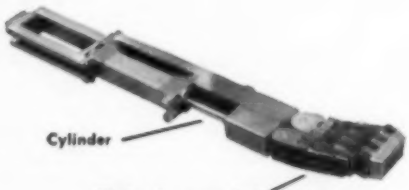
▲ Close-up view of machine used to produce 4th bend in long side rail member. Five different bends are made in this piece, each in sequence on separate machines. Accuracy is held within .030" to .045" at seven check points. Spring-back is easily controlled by simple stop settings — an important factor that cuts tool costs.

Production Bending Methods Simplify Fabricating Problems, Cut Assembly Costs

● The unusual versatility of PINES Bending Machine methods is again demonstrated by the successful production line application shown above in a large plant manufacturing automobile frames. Proven by more than eighteen months of operation, a battery of twenty-eight special PINES Benders are now forming tapered welded steel tube frame members at a rate of 120 bends per hour. These machines with their ingenious tooling — designed, developed, and built by PINES — form seven bends in each side rail member and produce more accurate parts than ever before possible. The end result is a stronger, more accurate chassis that greatly reduces body assembly problems.

Typifies Progress in Cold Bending Techniques

This revolutionary new manufacturing method is the result of long months of cooperative efforts between Pines and automotive engineers. It is typical of the consistant progress being made in profitable application of cold bending in the manufacture of a wide variety of metal products. It may also pay you to investigate the design possibilities and the production advantages of cold bending the "Pines-way." At your first opportunity call in our Sales Engineers for free survey.



▲ View of a flexible articulate mandrel used for making a bend at a right angle to, and within, a previously bent section. Mandrel is automatically inserted and expanded. Insures smooth, neat bends.

Write FOR MORE DATA

If you would like case study data on production bending, write today for free copies of Pines News.

PINES ENGINEERING CO., INC.

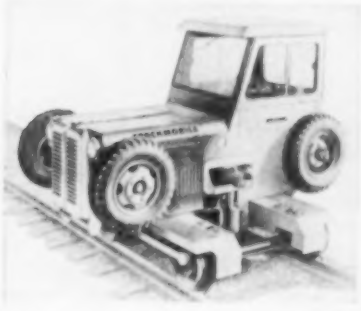
Specialists in Tube Fabricating Machinery

662 WALNUT • AURORA, ILLINOIS

PRODUCTION BENDING • DEBURRING • CHAMFERING MACHINERY

unit can develop a draw-bar pull of 12,800 lb—enough to pull a number of loaded freight cars.

The 3TM operates equally well on track or road. By retracting its four pneumatic-tired road wheels when the unit is astride



tracks, the unit is ready to roll on its steel rail wheels. Extensive tests indicate the new Trackmobile will offer all the efficiency and low cost freight car handling advantages of earlier models. Whiting Corp., Harvey, Ill. (Booth 1029)

Fiber Boxes

Delicate or highly finished products are protected by this material handling box.

Light canvas liners are placed on a steel rod in one end of the box. They eliminate loose paper and other types of separators. Spaulding Fibre Co. Inc., Dover, N. H. (Booth 1328)

Diesel Engine

The supercharged Model 135-DKBS is a heavy-duty, 6-cylinder, 4-cycle diesel with 426-cu-in. displacement. The engine burns all standard diesel fuels having cetane values of 45 or above.

The exhaust turbocharger system affords an increase in horsepower with a minimum of parasite load. Other advantages of the exhaust turbocharger: A relatively light and compact installation, flexibility in mounting and the elimination of mufflers on most applications because of the smoothing out of the exhaust impulses by the turbocharger turbine. Waukesha Motor Co., Waukesha, Wis. (Booth 801)

Fork Lift Trucks

Features of the new Pace-Maker series include power steering, automatic transmissions and positive-action hydraulic systems. The trucks are available in lifting capacities from 6000 to 11,000 lb, with gasoline, diesel and LP-Gas engines.

A new functional body design provides greater driving comfort and easier accessibility to engine and parts. Improved construction features contribute to good truck balance, positive operating control

and dexterous load positioning. Adjustable offcenter seating assures maximum visibility. Towmotor Corp., 1226 E. 152nd St., Cleveland 10, O. (Booths 1112, 1206, 1301)

Wheel Conveyors

A new line of aluminum gravity wheel conveyors features low weight and high strength. Portability makes the conveyors useful where setups are rearranged frequently.

Rust and corrosion-proof, the conveyors are available in 5, 8 and

10-ft sections and 12 and 18-in. widths. Left and right-hand curves of 45 and 90 degrees are available. Wheels (aluminum or cadmium plated) are 2 in. in diameter. Sage Equipment Co. Inc., 30 Essex St., Buffalo, N. Y. (Booth 1240)

Gondola Covers

Corrugated steel covers protect shipments from rain, snow and dirt. The covers can be removed by a track-side crane in less than a minute.

Two covers, 22 ft long, 5 ft 10 in. high and 6 ft ¼-in. wide, are needed for each car. One cover can be stacked on another during unloading. Republic Steel Corp., Republic Bldg., Cleveland 1, O. (Booth 900)

Trailer Coupler

A compression spring in the automatic trailer coupler makes disengagement impossible during transit over rough floors and ramps.

The bail section eliminates backing up problems and permits safe coupling even at an angle. Nutting Truck & Caster Co., 1201 W. Division St., Faribault, Minn. (Booth 513)

Industrial Trucks

The Transporter series of electric trucks includes pallet models, high and low-lift platform trucks, high-lift, suspended-load-type stackers and tractors.

A set of spring-loaded pawls holds the unloaded pallet firmly while the forks enter. A three-speed control permits the operator

THE ANSWERS THROUGH RESEARCH

CHIEF SANDUSKY

FERROUS AND NON-FERROUS CENTRIFUGALLY CAST ROLLS, SLEEVES, TUBES, LINERS, CHUTES, RETORTS, RINGS, BUSHINGS, BEARINGS, ETC.

Sandusky Foundry technicians and engineers are constantly developing means of producing better ferrous and non-ferrous centrifugal castings. Experienced production personnel, the latest in product control, extensive field testing and laboratory research assure close grained, sound castings of maximum strength, added to extreme resistance to heat, corrosion, and abrasion.

Excellent machining facilities for drilling, turning and boring are available.

Look to Sandusky as an organization of specialists with the answers to your problems with the finest of centrifugal castings. ALWAYS SPECIFY CHIEF SANDUSKY.

C. M. Lovsted & Co., Seattle, Wash. • Tynes Bros., Birmingham Ala. • Cordes Bros., San Francisco and Wilmington, Calif.

Chief SANDUSKY CENTRIFUGAL CASTINGS

FERROUS AND NON-FERROUS

SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio

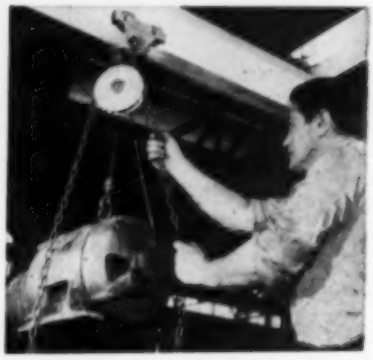
NEW PRODUCTS and equipment

to inch his truck forward or back with smoothness and precision.

The operator-led trucks measure only 21½-in. long (plus length of load) yet have a standard 8¼-in. battery compartment. Automatic Transportation Co., 149 W. 87th St., Chicago 20, Ill. (Booths 1234, 1332)

Chain Hoist

The Midget Chain Hoist can lift 250 lb with 50 lb of effort. The unit has a standard lift of 7 ft. Extra chain is available for higher lifts.



Each hoist is factory tested 100 per cent over rated capacity. The load is held safely by an automatic load brake at all times, reducing the possibility of accidents. Coffing Hoist Division, Duff-Norton Co., Danville, Ill. (Booth 109)

Skid Lift Truck

This unit combines a battery-operated truck with a hydraulic crane.

The crane will handle loads of

(Photo courtesy of Detroit Steel Corp.)

Ultra-Modern

Topping a heat from one of four 250 ton open hearths designed and built by Loftus at Detroit Steel's Portsmouth Plant.

Loftus OPEN HEARTH DESIGN

Loftus has engineered and erected 81% of all the new open hearth capacity installed since 1938 by independent engineer-contractors. Behind these installations is "know-how" acquired and developed over the years by an organization which offers a "package" service to the entire steel industry. From drawing board to first tap, your problems will be solved by specialists with experience, explaining why "Loftus Builds 'em Better."

- **increases availability**
- **promotes lower cost operation**

Loftus Open Hearth design and construction combines proven experience with completely modern furnace concepts. It assures you of a better, more automatic furnace with less down time. Lower operating costs are more than just a possibility.

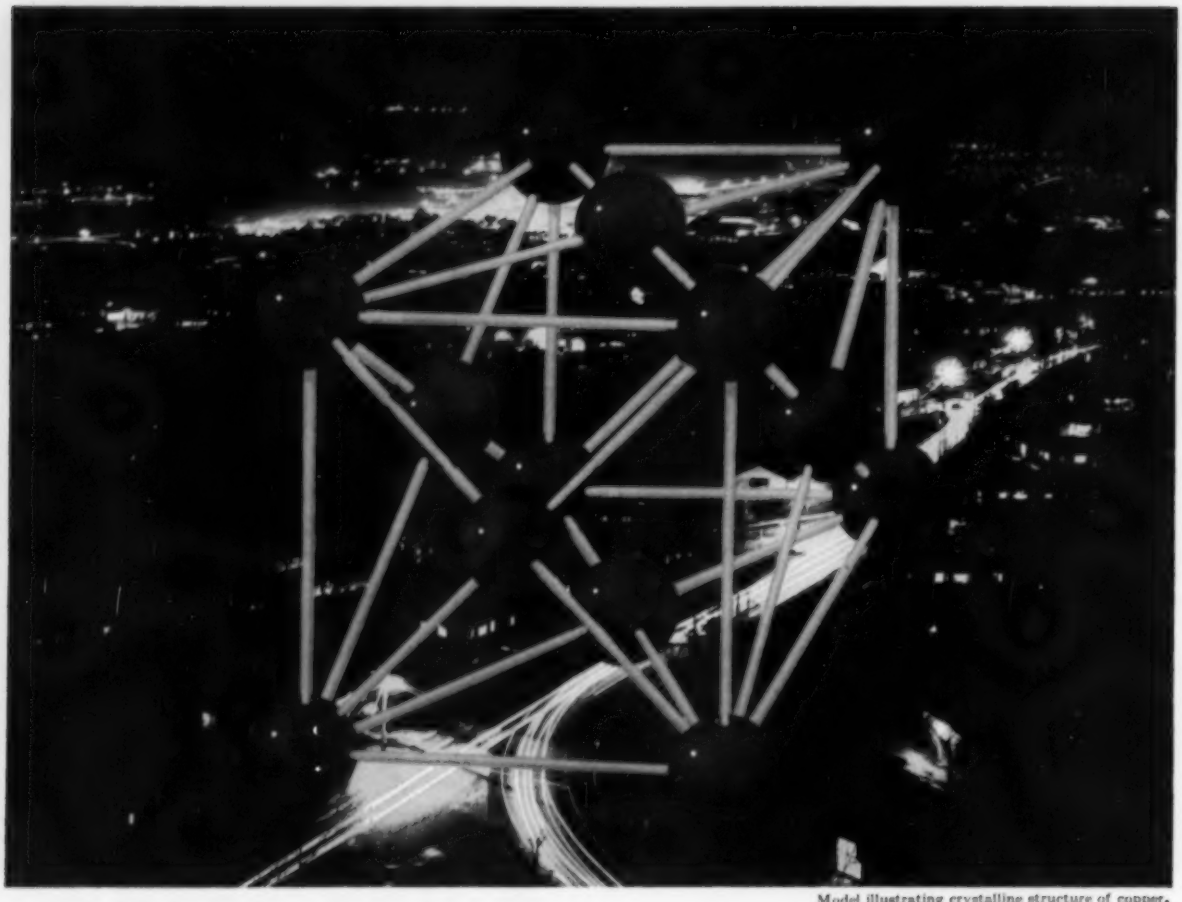
LOFTUS OPEN HEARTH DESIGN INCLUDES:

- Completely Automatic Reversal
- Full Sloping Back Wall Between Port Throats
- Water-cooled Doors with Archless Frames
- Water-cooled Front Buckstays
- Basic Suspended Ends Including the Port End Arches
- Flat Suspended Fantails and Regenerator Roofs
- Electronic Roof Temperature Controllers Automatically Regulate Fuel Flow
- Full Automatic Fuel-Air Ratio Control
- Front and Rear Slag Flush

WRITE TODAY FOR
An informative brochure on Loftus Design

Loftus ENGINEERING CORPORATION
Designers and Builders of Industrial Furnaces
610 Smithfield Street, Pittsburgh 22, Pennsylvania

54.23.12



Model illustrating crystalline structure of copper, against a background view of Oak Ridge.

COPPER

...essential to the Atomic Age !

When the Atomic Age dawned . . . copper was at hand to implement it.

It was *copper* that facilitated the building of nuclear accelerators or "atom smashers". . . the backbone of basic atomic research. The magnet of a modern cyclotron and its control circuits require some 300 tons of copper. And in the maze of analytical instrumentation, copper is indispensable.

The whole history of America is one of progress through inventions . . . and most inventions have in some way been dependent on copper.

The steamboat, with its copper boilers, ushered in a new Age of Water Transportation. Telegraph and telephone lines needed copper to make possible a new Age of Communications. Marconi's "wireless", with its coils and cables of copper, started the Age of Electronics.

As your Company moves ahead into the Atomic Age, move ahead with *copper . . . in every age, the metal of progress!*

COPPER & BRASS
RESEARCH ASSOCIATION

420 Lexington Avenue, New York 17, N. Y.

. . . AN INDUSTRY SOURCE OF TECHNOLOGICAL AID, INCLUDING A LIBRARY OF TECHNICAL LITERATURE AND A COUNCIL OF SPECIALISTS

COPPER OR ITS ALLOYS PROVIDE THESE ADVANTAGES:

Best conductor of electricity commercially available

Does not rust . . . high corrosion resistance

Best heat transfer agent of all commercial metals

Easy to machine, form, draw, stamp, polish, plate, etc.

Welds readily . . . excellent for soldering and brazing

1000 lb, while the lift truck will carry 4000-lb loads. The driver may ride facing either end of the machine. Materials Handling Division, Market Forge Co., 35 Garvey St., Everett 49, Mass. (Booth A1019).

Crane

The Coles is a gasoline or diesel-electric crane. The engine turns over a variable voltage generator which provides power for all motions. This eliminates clutches, cuts down maintenance and fuel consumption and gives the maximum in smoothness and precision.

All cranes made by this company are equipped with an automatic safeload indicator, which stops the unit if the operator tries to lift more than the rated load. Coles Cranes Inc., Joliet, Ill. (Booth 1630)

Crane Control Panel

An alternating-current control panel for NEMA Class II service applications is designed for use with mechanical load braking systems. It can be made to meet requirements of floor or cab operation.

The panel features easy-access wiring, all front-connected devices and removable doors. It is available in widths of 20, 30, or 40 in. and in combinations of these

A Conco engineered Crane is **top management's** idea of value. Quality like this means minimum maintenance cost, slow depreciation, tailored-to-the-job engineering, reduced accident hazards. Conco engineered Cranes reflect the more than 37 years experience that lies behind them. Write for bulletin 5000A covering the complete line of Conco cranes, hoists and trolleys.

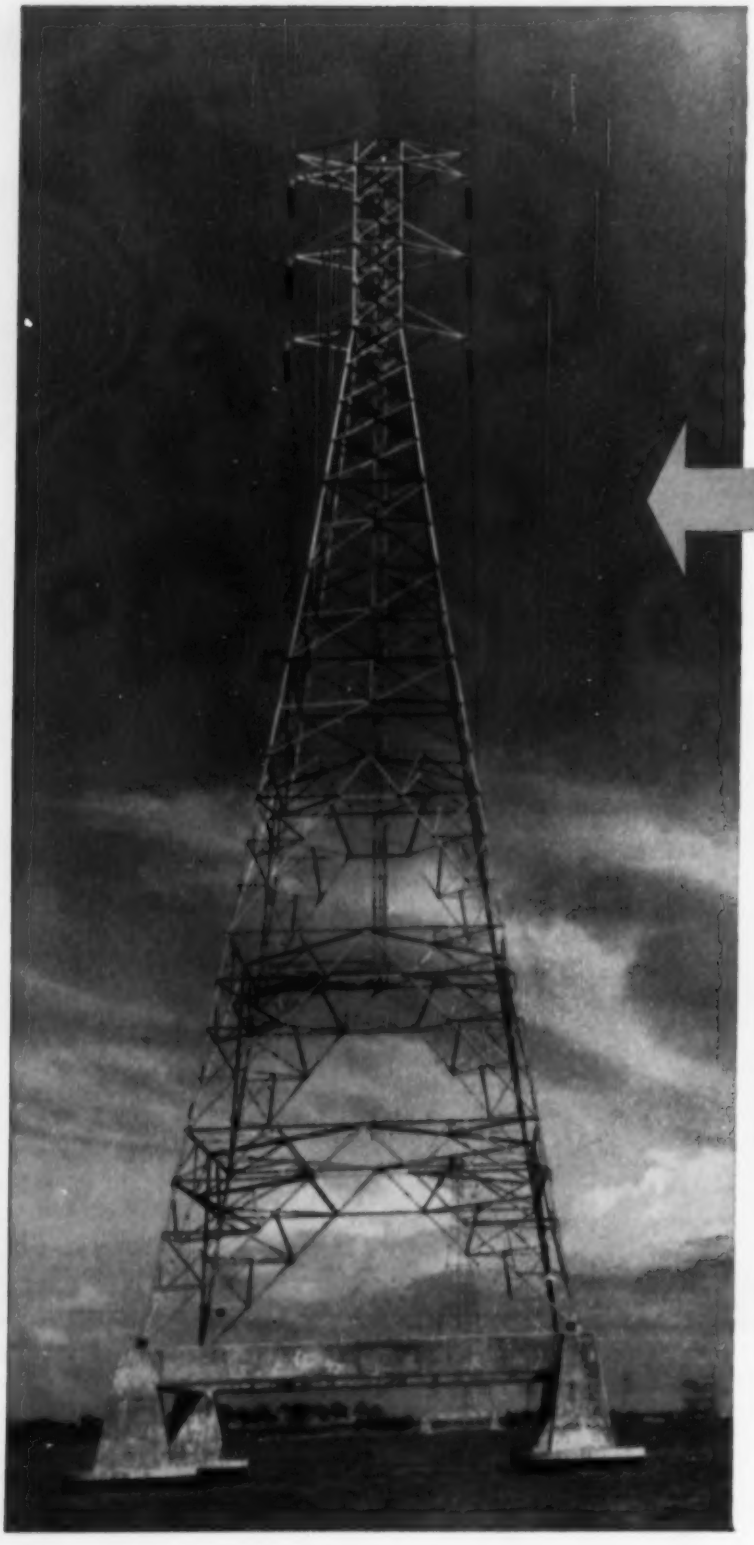
FROM ANY VIEWPOINT
A FINER CRANE

CRANES HOISTS CONCO

CONCO ENGINEERING WORKS
Division of H. D. Conkey & Company 70-14th Ave., Mendota, Illinois
AFFILIATES: Conco Engineering Works—Domestic Heating Equipment • Conco Building Products Inc.,—Brick, Tile, Stone

JIB CRANES | ELECTRIC HOISTS | CHAIN HOISTS AND TROLLEYS | HAND GEARED CRANES | CRANE ASSEMBLIES

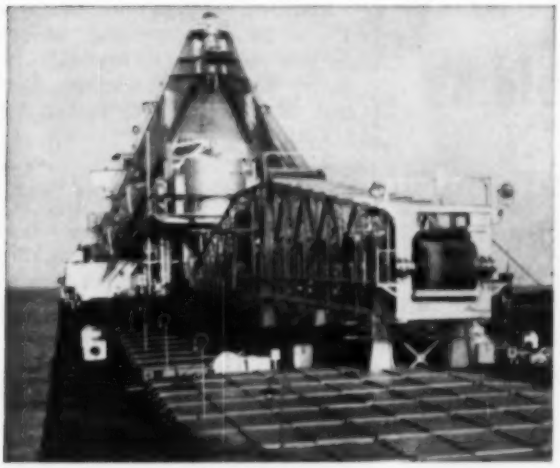
You can make it better



ERECTION COSTS REDUCED $7,200 by using USS MAN-TEN Steel rather than carbon steel in the legs of four 198 ft. transmission towers that carry power lines across Old Tampa Bay, Florida. Six tons of weight saved by MAN-TEN Steel in the East Bank tower saved $1,200 in erection cost. The 6½ tons saved in each of the three towers erected in the Bay saved $6,000 more. The total of 26 tons of steel saved by using MAN-TEN Steel also reduced the cost of the material used in the towers, even though MAN-TEN Steel costs a little more per lb. (Towers designed and fabricated by American Bridge Division of United States Steel for Florida Power Corporation, St. Petersburg, Fla. Erected by Southeastern Utilities Service Co., Miami, Fla.)

THE SUPERIOR STAMINA and corrosion resistance of USS COR-TEN Steel save power by saving weight, insure minimum maintenance and longer service life in this full-length "dome" lounge car built for the Milwaukee Road by Pullman-Standard Car Manufacturing Company, Chicago, Ill. More than 6,000 modern passenger cars and 190,000 freight cars of all types have been built to date with USS COR-TEN Steel.

with USS High Strength Steels



USED IN THE LOADING BOOM and supporting "A" frame of this self-unloading cargo vessel which can discharge 4,500 tons of limestone per hour, USS TRI-TEN "E" Steel not only materially increases the strength and durability of the structure but saves more than 18,000 lbs. of weight. 50,000 lbs. of TRI-TEN "E" Steel in plate and structural form were used in this application. (Designed by Robins Engineers, Division of Hewitt-Robins, Incorporated, for Manitowoc Shipbuilding, Incorporated.)

WEIGHT WAS REDUCED 10% yet strength-to-weight ratio was increased over former construction by using USS MAN-TEN Steel in the arch boom, "A" frame and tongue of this heavy-duty logging unit. The increased strength provided by MAN-TEN Steel makes it possible to handle log loads of maximum size—the reduced weight ensures greater mobility and maneuverability. Result: more footage, handled faster. (Designed and built by Hyster Company, Portland, Ore.)

IN USS HIGH STRENGTH STEELS, design engineers have at their command three service-tested steels that will permit them to materially increase the efficiency and economy of machinery, equipment and structures at little or no increase in first cost . . . and frequently, at a saving.

All three of these famous "steels that do more" – USS COR-TEN, USS MAN-TEN and USS TRI-TEN – have a 50% higher yield point than ordinary carbon steel. All have better corrosion resistance and offer greater resistance to wear, fatigue and impact. Each, however, has specific superior properties that should be considered in determining its selection.

USS COR-TEN Steel, for example, is distinguished by its superior resistance to atmospheric corrosion—4 to 6 times that of carbon steel. USS MAN-TEN Steel is intended for weight reduction by means of greater strength in moderate forming applications, with enhanced resistance to abrasion and atmospheric corrosion. USS TRI-TEN Steel's outstanding characteristics are excellent weldability and resistance to shock at low temperatures.

Used singly or in combination, these steels can advantageously replace carbon steel to increase the strength and durability of vital parts *without* increasing their weight. Or when the use of thinner sections is feasible they can (1) reduce equipment weight without reducing its strength, or (2) increase the size and capacity of equipment without increasing total weight or the power required to move it.

You will find our 174-page *"Design Manual for High Strength Steels"* extremely useful in applying the benefits of these steels to your product. Send for free copy—simply write on your company letterhead to United States Steel Corporation, Room 5366, 525 William Penn Place, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

1933 USS HIGH STRENGTH STEELS 1956
UNITED STATES STEEL
23 YEARS OF PERFORMANCE

USS HIGH STRENGTH STEELS

USS MAN-TEN • USS COR-TEN • USS TRI-TEN

UNITED STATES STEEL

Bitumastic® Coatings
...how to solve your toughest corrosion problems

This steel piling is subjected to salt air and salt water—a highly corrosive combination. But the steel is not attacked because it's protected by Bitumastic® No. 50—a heavy-duty coating specially formulated to control the severest corrosive forces.

TOUGH CORROSION PROBLEMS can be solved, but not by using ordinary paints or conventional protective coatings. For long-term protection, it takes *specialized* protective coatings . . . the Bitumastic Coatings Koppers makes.

Bitumastic Protective Coatings are specially formulated from a tar-pitch base* that is, for all practical purposes, impervious to moisture. These coatings keep moisture away from exposed metal surfaces . . . and that's the *best* way to stop corrosion.

With tough, durable Bitumastic Protective Coatings, a thickness up to eight times that of ordinary paints can be obtained in one application. Where other factors are equal, the *thicker* the coating the *longer* the period of protection.

Send for a set of free booklets describing the family of Bitumastic Protective Coatings. At the same time, tell us about *your* corrosion problems so that we can suggest a satisfactory solution. There is no obligation, of course.

**Hi-Heat Gray is a non-coal-tar vehicle and metallic pigment.*

KOPPERS COMPANY, INC.

Tar Products Division, Dept. 778-T, Pittsburgh 19, Pennsylvania

DISTRICT OFFICES: BOSTON, CHICAGO, LOS ANGELES, NEW YORK, PITTSBURGH, AND WOODWARD, ALA.

KOPPERS

MADE ONLY BY KOPPERS

BITUMASTIC® PROTECTIVE COATINGS

REG. U.S. PAT. OFF.

SOLD THROUGH INDUSTRIAL DISTRIBUTORS

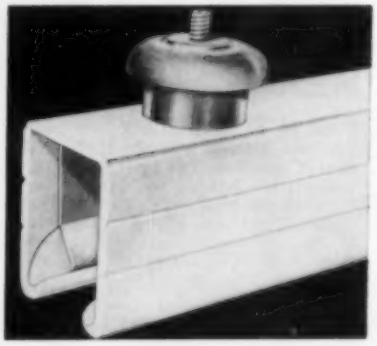
NEW PRODUCTS and equipment

widths, depending on the number of motions required.

Standard depth is 8 in.; height is 15 or 25 in., depending on the number of devices needed. Industry Control Department, General Electric Co., Roanoke, Va. (Booth 205)

Crane Electrification

Hazards of open conductor bars are overcome by Shok-Pruf electrification. The insulated channel conductor is made exclusively for monorail and crane systems.



The slide collector increases service life up to ten times. Conductors come in 10-ft lengths. Curves are readily formed to any radius. Louden Machinery Co., Fairfield, Iowa (Booth 1015)

Emergency Lighting

This battery-powered equipment is designed to floodlight large areas. It may be permanently installed or used as a portable unit that plugs into any 115-volt, alter-

THE TREND TO CECO-DROPS...

JAMESTOWN, N. Y.

ITUATION: Growing sales were taxing production capacity of tool mfr's. forge shop. Had four belt-driven board drop hammers.

SOLUTION: Four Ceco-Drops now in operation —have been giving excellent service. Production is up—maintenance is down. "3 hours charged against Ceco-Drops in 42 days" —"One Ceco-Drop ran 108 hrs. (21 days) without maintenance or die work."

ALLENTOWN, PA.

ITUATION: Tool works had the problem of keeping 23 "old dog" board drop hammers operating profitably. Had but one recent model "J" Chambersburg Board Drop.

SOLUTION: Management launched a modernization program calling for nine Ceco-Drops capable of producing a yearly tonnage in excess of the 23 old board drop hammers. Four of the Ceco-Drops are now in operation, shop layout has been revised. Efficiency and production methods have been improved.

SKOKIE, ILL.

ITUATION: One of largest manufacturers of hand tools is planning a new shop. Decided to have modern Gravity Drop Hammers.

SOLUTION: Selected Ceco-Drops, and on a programmed basis is replacing board drop hammers with Ceco-Drops. To date, two 2,000 lb. Ceco-Drops and one 2,500 lb. Ceco-Drop are in operation — "Doing fine". Another 2,500 lb. Ceco-Drop on order.

FLINT, MICH.

SITUATION: Large Auto Co. with 16 Board Drop Hammers—(7 of them Chambersburg "J's")—ranging in age from 7 to 30 years. Lowered production rates and mounting maintenance costs.

SOLUTION: Started modernization in 1953. Converted* four "J's" with Ceco-Drop upper works. Cost and down time reduced —production up—operators like them. Other "J's" to be converted*. Ceco-Drops will replace older board hammers.

*Saves cost of anvil and foundation!

COLUMBUS, O.

SITUATION: Job shop with 5 Board Drop Hammers finds equipment obsolete—cannot compete with lower prices and higher production of other more modern shops.

SOLUTION: Initiated 10 year program of modernization to include 15 Ceco-Drops. Three Ceco-Drops already installed to replace board drop hammers.

The gravity drop hammer with short stroke control

... and remember the Lansing Story?

LANSING, MICH.

Lansing, Mich. is unique among industrial cities in the concentration of drop forging activity in its many factories. It may well claim the title of "Drop Forging Capital of the World". In Lansing are six great forging shops covering 14 acres of land, with a working area of 985,579 sq. ft. All these great forging shops are using Chambersburg Ceco-Drops.

Forge Shop No. 1—installed the first Ceco-Drop in 1947—now forging connecting rods.

Forge Shop No. 2—has installed 6 Ceco-Drops since 1950—making automotive forgings.

Forge Shop No. 3—bought 4 Ceco-Drops since 1948—Commercial and automotive forgings.

Forge Shop No. 4—bought seven Ceco-Drops in the last six years.

Forge Shop No. 5—Purchased 3 Ceco-Drops in 2 years.

Forge Shop No. 6—One of largest in world Installed 11 Ceco-Drops since 1951.

CHAMBERSBURG ENGINEERING CO.

CHAMBERSBURG • PENNSYLVANIA

nating-current outlet. The two floodlamps can be adjusted to any position.

When power fails, the emergency unit goes into action automatically. It shuts off automatically when power is restored. The battery which will last up to 8 hours, is recharged rapidly after use. Storage Battery Division, Thomas A. Edison Inc., West Orange, N. J. (Booth 901)

Truck Mounted Crane

The Model TM-¼ is a quarter-ton capacity, hand-operated hydraulic crane. Weighing only 100 lb, it can easily be mounted on any truck, tractor, wagon, dock or floor.

The crane rotates 360 degrees in its well and can be locked at any of 12 positions. The well mounts on top of the truck deck and is braced to the chassis from below.

Hydraulics have been combined into one self-contained unit, including lifting cylinder, pump, release valve and overload relief, which is set at 700 lb. The crane has a vertical travel of 68 in. Ruger Equipment Inc., Uhrichsville, O. (Booth 108)

Self-Feeding Rack

The Pick-A-Case rack guarantees rotation of stock. The rack is fed from the rear. Gravity takes the material to the front.

For every lineal foot of rack, it is possible to have a minimum

of ten items readily accessible for immediate issue.

Only one aisle for every 8-ft-deep section is needed; 50 per cent of the aisle space in the storage area is saved. Arteo Corp., Flourtown, Pa. (Booth A1014)

Wire Mesh Containers

The Bulk Cargotainer is designed for transporting and storing granular materials. A cloth, plastic, paper or rubber liner can be inserted in the rectangular container to hold loose materials without spilling.

A drop bottom allows the liner to be unzipped or ripped open to let the material flow into a machine or other container. Wire mesh construction protects the liner on all sides and prevents accidental ripping or tearing. Like all Cargotainers, bulk models can be piled up to four high to save storage space.

Another new model to be introduced is the Rigid Cargotainer, developed for users not interested

Here is an IMPORTANT conveyor message for the metalworking industry

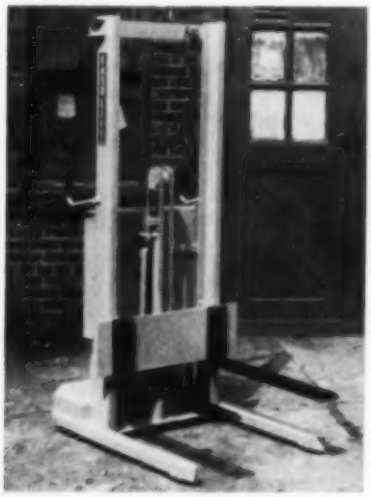
Write today for complete information.

MAY-FRAN ENGINEERING, INC.
1725 Clarkstone Road Cleveland 12, Ohio

in collapsibility. Pittsburgh Steel Products Division, Pittsburgh Steel Co., Grant Bldg., Pittsburgh 30, Pa. (Booth 500)

Hydraulic Stacker

The Model L, 1500-lb capacity stacker will lift a load from the floor to as high as 120 in. It



stacks barrels, drums, cartons, bales, dies, parts or shop fixtures and loads and unloads trucks.

Speed of lift fully loaded is 15 fpm. Electric-hydraulic power is provided by a 12-volt, heavy-duty battery. The unit is 31½-in. wide and 50 in. long. Forks are 30 in. long. Over-all height is 14 in. above the required lift. Liftequip Co., 1979 E. 59th St., Cleveland 3, O. (Booth 401)

Bin Level Control

The improved, heavy-duty "Tel-level" is recommended for use in bunkers and above storage piles where the control unit may be subjected to heavy impact loads—lumps of stone, coal, ore and other materials which are over ¾-in.

The control switch is activated by a steel pyramid float. Switch housing is a one-piece unit of spun steel, tapped at one end for electrical conduit and sealed at the other end by a molded rubber grommet.

The level control can be mounted at the top of a bin so the material will tilt the float and stop the conveyor when the bin fills. It can be mounted at the bottom of a bin so that as the bin empties the float will hang vertically and start a conveyor. Stephens-Adamson Mfg. Co., Aurora, Ill. (Booth 316)

Overload Signal

Installed on a fork lift truck, the signal warns the driver that the load exceeds safe operating capacity.

The signal consists of a vacuum switch and bell or light. The switch is attached to the hydraulic system of the Hydra-Lizer. (Standard equipment on this company's trucks, the Hydra-Lizer is two hydraulic cylinders on which the rear wheels are mounted. The cylinders are interconnected to compensate for up to 3 in. of unevenness in the floor.)

When the truck is overloaded, the rear wheels start to rise off

NOW YOU CAN ASSEMBLE YOUR OWN "CUSTOMIZED" CONVEYORS FROM PRE-FABRICATED STANDARD SECTIONS.

If your plant produces stampings, formed metal parts, castings or forgings . . . if you have a byproduct such as automotive scrap, chips and turnings . . . the MAY-FRAN conveyor standardization program will provide your company with savings never before possible.

Through standardization, MAY-FRAN now makes it possible to assemble individual components into virtually any type of conveyor to handle a wide range of products or materials. Straight sections . . . concave or convex sections . . . take-up charge sections and discharge-end sections can be furnished to meet specific requirements of belt width as well as load bearing and volume capacities.

Even after they are installed, MAY-FRAN conveyors can be dis-assembled and re-assembled in other plant locations . . . to handle other products. Standardized conveyors can be lengthened, shortened or modified in almost any way . . . and at minimum cost.

Pre-fabricated conveyor sections can be furnished rapidly and inexpensively. The individual components provide users with the ultimate in flexibility. MAY-FRAN hinged-steel conveyor belting is used on the Standardized units. Belting is available in widths from 6 inches to 6 feet in any length. Solid and perforated links are available in pitch lengths from 2½ to 9 inches.

MAY-FRAN . . . a name long recognized in the materials handling field . . . is first again with standardized components for your customized installations.

6550-MF

Helping to "PAINT" your TV picture

WALLINGFORD

Stainless Steel Strip

This electron gun generates the pencil-like electron beam, or "paint brush," which sweeps across the fluorescent face of your television tube to "paint" the picture.

Vital elements of this gun are formed from ***Wallingford Stainless Steel Strip*** *held to extremely close tolerances to provide the uniform electrical characteristics that assure efficient, dependable performance.*

We offer this "television commercial" as one evidence of Wallingford's ability to meet YOUR most rigid specifications, whatever your design or manufacturing requirements. Visit our office and plant for even more positive proof.

THE WALLINGFORD STEEL CO.

WALLINGFORD, CONN., U.S.A.

SUPER METALS

STAINLESS • ALLOY • HIGH CARBON • LOW CARBON • STRIP

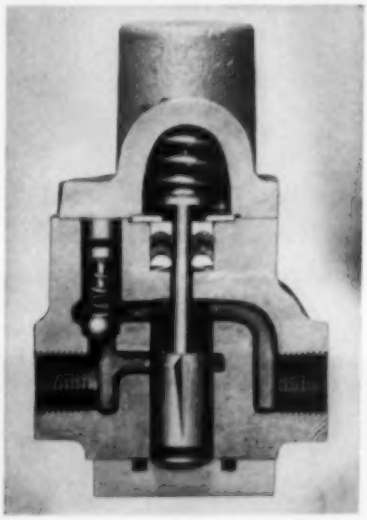
STAINLESS WELDED TUBES AND PIPE

NEW PRODUCTS and equipment

the floor, and hydraulic pressure in the Hydra-Lizer drops. This energizes the vacuum switch and sets off the bell or light. Lamson Mobilift Corp., Syracuse 1, N. Y. (Booth 1028)

Flow Control Valves

These hydraulic flow controls are pressure operated and actuated by load weight. The heavier the load, the slower the descent at any predetermined speed. The flow controls eliminate surge when lowering starts; this is particularly important when handling loads equal to a truck's rated capacity.



Valves are available for any maximum foot-per-pound rate of travel in sizes for 2000 to 30,000-lb fork trucks and for straddle trucks rated at up to 45,000 lb in capacity. Benton Harbor Engineering Works Inc., Benton Harbor, Mich. (Booth A1017)

Crane Controller

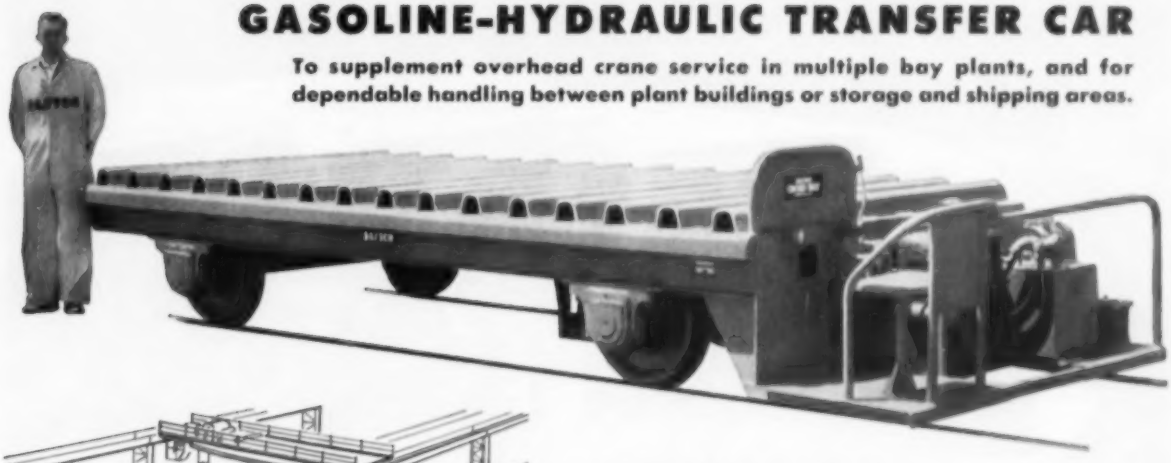
Panels for all motions of the hoist, trolley and bridge, as well as the resistors, are mounted in a monolithic enclosure. The magnetic controller uses a new style protective panel having circuit interrupters and undervoltage protection with pushbutton reset.

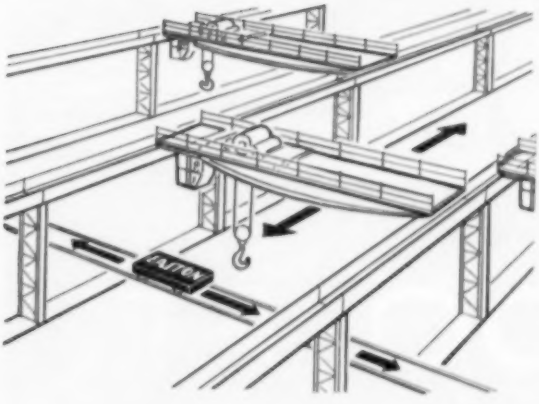
Each panel has timing relays for the last two speed points (there are a total of five) as well as overload relays. Resistor units

NEW CROSS-BAY®

GASOLINE-HYDRAULIC TRANSFER CAR

To supplement overhead crane service in multiple bay plants, and for dependable handling between plant buildings or storage and shipping areas.

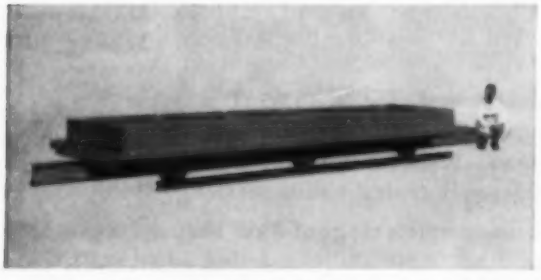




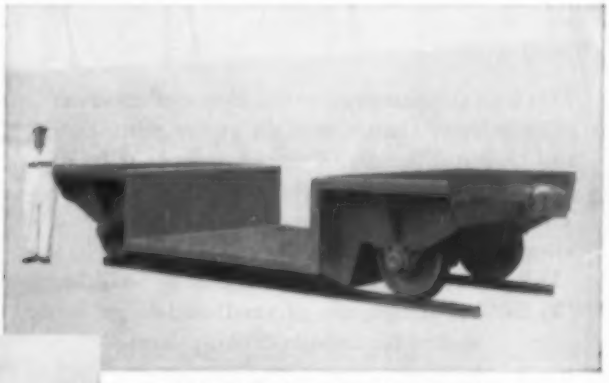
EASTON CROSS-BAY CARS are custom-built to meet speed and capacity requirements. Special superstructures can be designed for specialized or mechanized handling. The gasoline-hydraulic Cross-Bay Car illustrated above was built for steel warehouse work. It provides a capacity of 25 tons plus 50% for impact loading, and a two-way speed of 50 feet per minute.

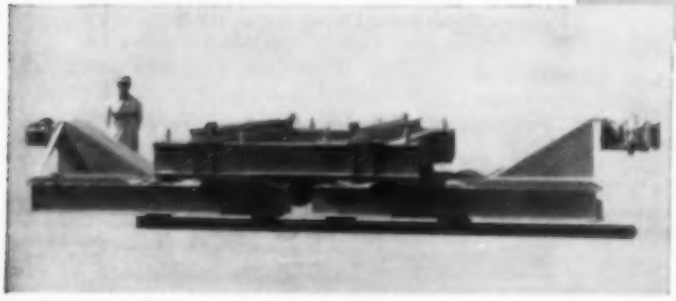
In addition to the gasoline-hydraulic car shown above Easton Cross-Bay Cars may be powered by electric motor, electro-fluid drive, gasoline-electric drive or storage battery. Capacities from 5 to 500 tons. Controls may be manual, electric (by push-button on the car or remote station) or electronic.

SEE EASTON FIRST FOR CUSTOM-BUILT CARS FOR INDUSTRY



Annealing Furnace Car Equipped with Rack Beam ▲





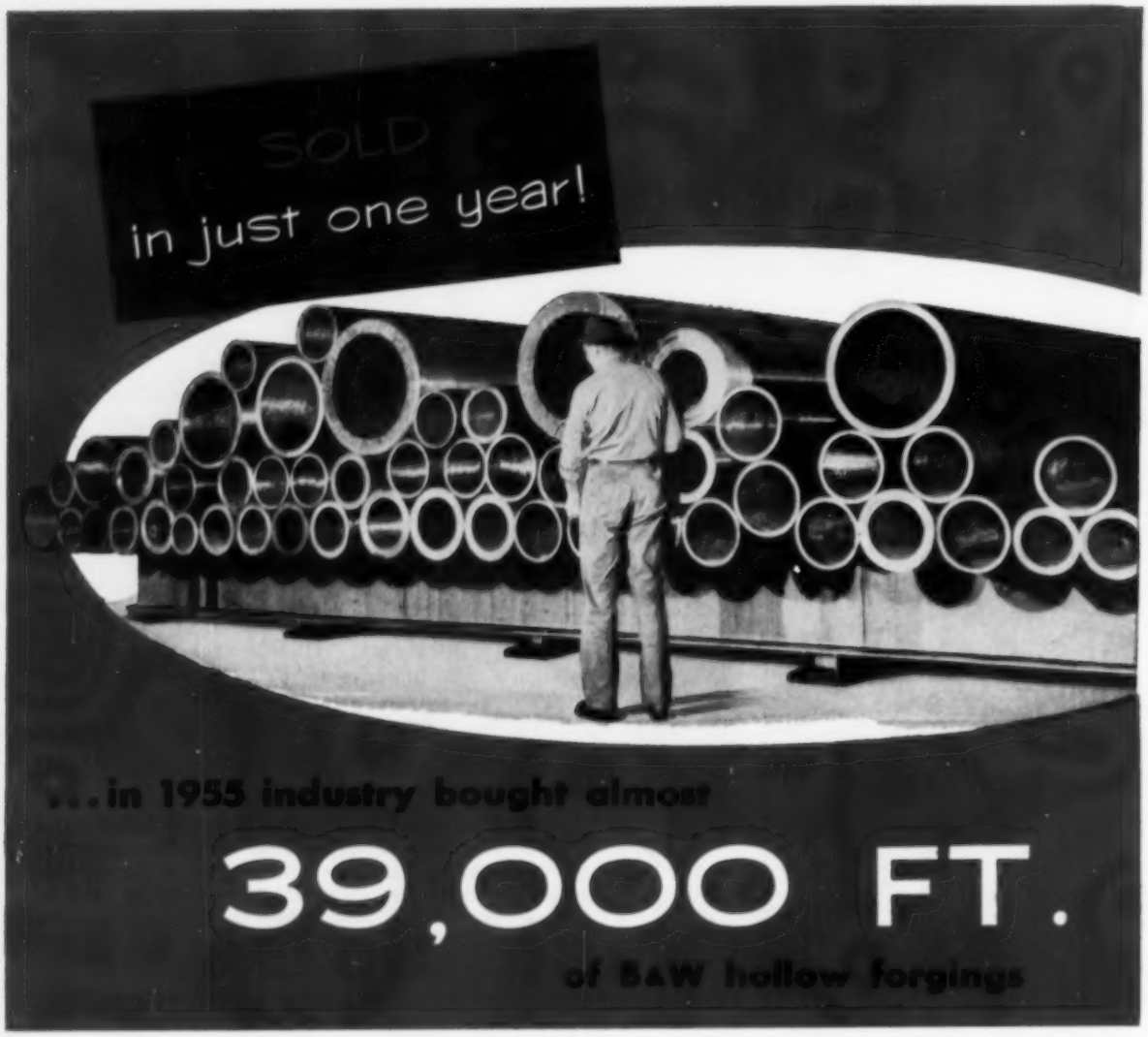
▲ Split-level Platform Car—Capacity 50 tons

◀ Double-truck Transformer Transfer Car —Capacity 150 tons

A-1049

EASTON®

EASTON CAR & CONSTRUCTION COMPANY • EASTON, PA.



This is an acceptance story that is more than seven miles in length! In one year, the power, petroleum and chemical industries placed orders for B&W Hollow Forgings in quantities measured by miles. The measure of their quality is based on two always-present facts:

1) B&W's unparalleled manufacturing facilities;
2) B&W's acceptance of small and large orders for definite delivery dates.

B&W Hollow Forgings are produced in a large range of fractional inch sizes and a selected range of standard pipe sizes in accordance with the following ASTM Specifications: A 106-52T seamless carbon-steel pipe for high-temperature service. Seamless drum forgings of A 266-54 carbon-steel. A 312-54T seamless and welded austenitic stainless steel pipe. A 335-53T seamless ferritic alloy steel pipe for high-temperature service. A 376-54T seamless austenitic steel pipe for high-temperature central-station service.

For the complete range of B&W Hollow Forgings plus other important information on what B&W has to offer you in Hollow Forgings, send for Bulletin S-16B. The Babcock & Wilcox Company, Process Equipment Department, Barberton, Ohio.

BABCOCK & WILCOX

BOILER DIVISION

S-488

are in a separate ventilated compartment. Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y. (Booth 102)

Lift Trucks

The newest unit in the Hydrolectric line—Model KHTP (see photo)—is a high-lift, nesting-type fork or pallet truck. It is used primarily for stacking single-faced pallets and skid platforms.

Also to be shown is the Hydrolectric Model KPW, low-lift pallet truck. Like all trucks in this line, it features the Dyna Dual Power Unit, which is a twin-wheel drive working through a work gear, giving a differential action. Lift Trucks Inc., Cincinnati 14, O. (Booth 702)

Hydraulic Shovel

The Allen hydraulic shovel attaches to the fork bars of the lift truck in the same manner as the forks. It is operated by a double-acting hydraulic cylinder.

Full control permits the load to be dumped at any speed. The shovel may be returned to the horizontal at any time without lowering to the ground for latching.

Construction is heavy for long-life, low-service-cost operation. The blade is welded directly to the

materials-handling problems?

*get this free 12-page guide....

- Read how blue chip companies cut materials handling costs.
- See how a simple change in receptacles can speed your work.
- Discover how to reduce damage to expensive parts and components.
- Learn how to buy handling equipment that pays for itself.

WRITE NOW for your free copy of MATERIALS IN MOTION—your authoritative guide to real savings in materials handling. No obligation. Address Dept. HH.

NATIONAL VULCANIZED FIBRE CO.
WILMINGTON 99, DELAWARE
In Canada: National Fibre Company of Canada, Ltd., Toronto 3, Ontario

Fairless Works

uses

RESEARCH-COTTRELL PRECIPITATORS

for these gas cleaning jobs

Eleven Research-Cottrell Precipitators, handling 927,160 cubic feet of gas per minute with collection efficiencies of 95% and over, are installed or are being installed at U. S. Steel Corporation's Fairless Works.

Precipitators for blast furnaces and detarring are old, familiar applications for Research-Cottrell. At the end of 1955, 162 blast furnace and 464 detarring precipitators had been installed by Research-Cottrell, including these recent installations at the Fairless Works.

Scarfing and sintering machine applications are fairly recent developments, however. At present Research-Cottrell has installed two scarfing machine precipitators. Five iron ore sintering machine precipitators are in operation, and one more is under construction.

Research-Cottrell has also developed and installed precipitators for electric furnaces, ferromanganese blast furnaces and iron cupolas. For more information on any of these "steel industry" applications contact your nearest Research-Cottrell representative—or write for Bulletin GB.

Research-Cottrell, Inc.

Main Office and Plant: Bound Brook, N. J.
405 Lexington Ave., New York 17, N.Y. • Grant Building, Pittsburgh 19, Pa.
228 N. La Salle St., Chicago 1, Ill. • 111 Sutter Bldg., San Francisco 4, Cal.

BC 100

Scarfing Machines

Two precipitators clean scarfing machine gases (95,000 cfm) from a slabbing mill and blooming mill. Collection efficiency is 95%.

Blast Furnace

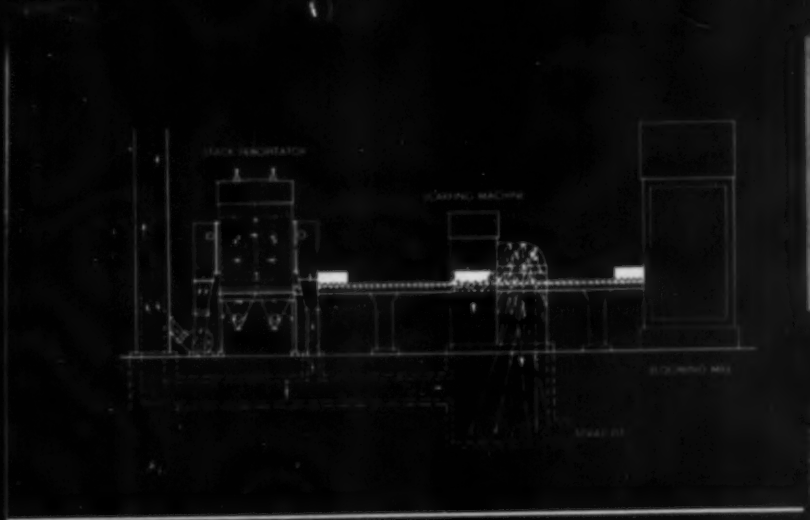
Four precipitators clean gas (330,000 cfm) from two blast furnaces. Efficiency is 95%.

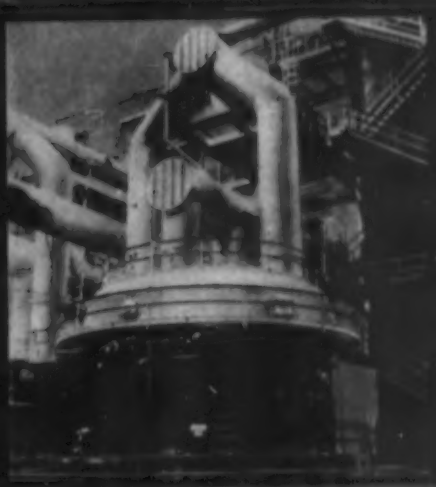
Detarring

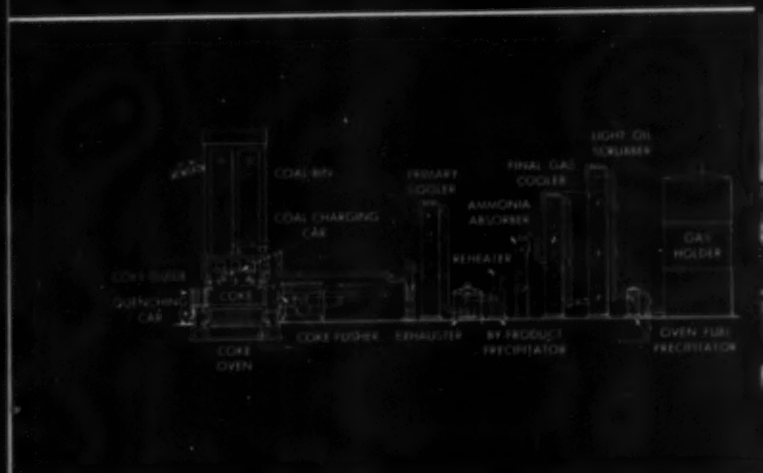
Four precipitators clean coke oven gas (62,160 cfm). Collection efficiency is 95%.

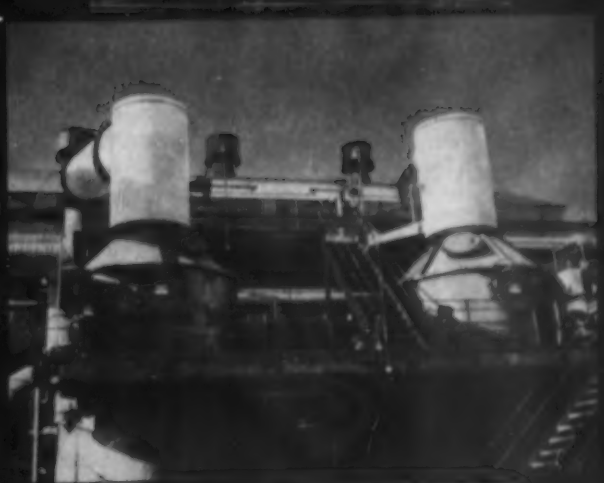
Sintering Machines

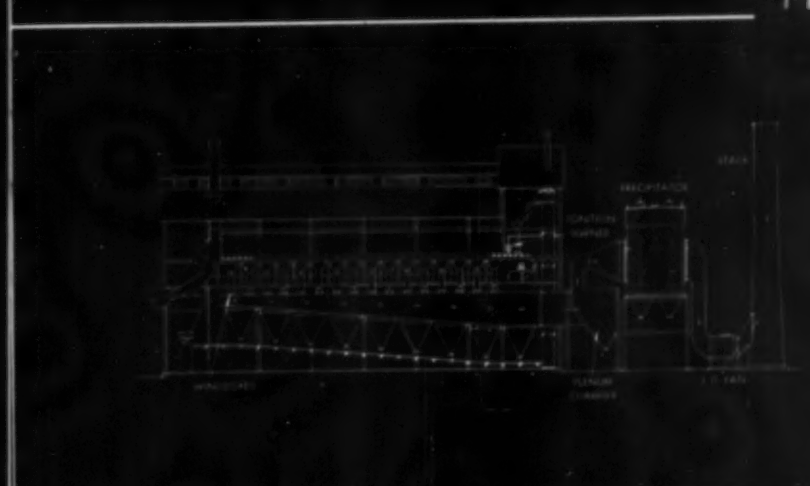
One precipitator (see cut-away drawing at right) will clean 440,000 cfm of gas from iron ore sintering machine. Collection efficiency of 95% is guaranteed.

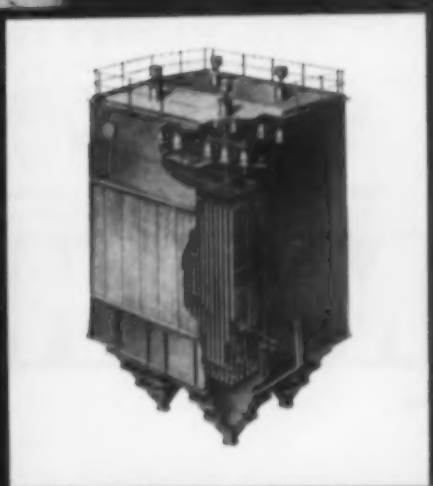




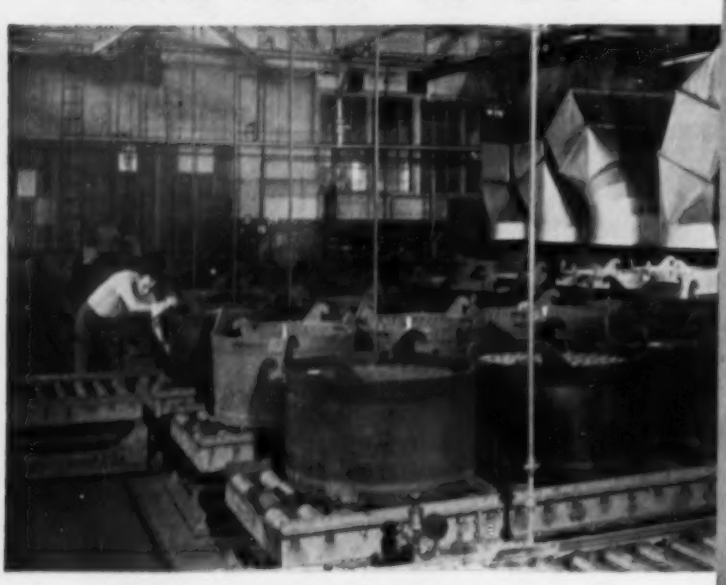

COAL BIN
COAL CHARGING CAR
PRIMARY COOLER
AMMONIA ABSORBER
REHEATER
FINAL GAS COOLER
LIGHT OIL SCRUBBER
GAS HOLDER
COKE OVEN
COKE PUSHER
EXHAUSTER
BY PRODUCT PRECIPITATOR
OVEN FLUE PRECIPITATOR







Very Few CONVEYING PROBLEMS are New to Us...



A system of spring-mounted roller conveyors, with transfer car, handling heavy pots in which pins and bushings are carborized.

Every day some manufacturer runs head-on into a conveying problem that's new to him . . . a handling job that he hasn't had to do before. It may be a package of unusual size or shape, or there may be unusual characteristics regarding space, temperature or weight.

Whatever the problem might be, chances are, we've done something like it, somewhere, sometime before.

That's where experience pays off, and you get the benefit of fifty years of it when you buy Mathews Conveyers.

50 YEARS OF MC MECHANIZED HANDLING

MATHEWS CONVEYER COMPANY

GENERAL OFFICES . . . ELLWOOD CITY, PENNSYLVANIA

PACIFIC COAST DIV., MATHEWS CONVEYER COMPANY WEST COAST, SAN CARLOS, CALIFORNIA

CANADIAN DIVISION . . . MATHEWS CONVEYER COMPANY, LTD. PORT HOPE, ONTARIO

Engineering Offices or Sales Agencies in Principal American and Canadian Cities.
Export Representative—Foreign Trade Division of New York Hanseatic Corp.

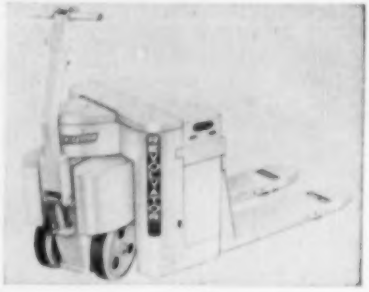
MATHEWS

NEW PRODUCTS and equipment

shovel body and can be easily replaced. Allen Industrial Products Inc., Battle Creek, Mich. (Booth 1337)

Pallet Truck

Here's a low lift hand truck that can be converted to a walk-along electric.



The pull handle and front wheel are readily removed and replaced with a battery compartment and traction unit. Revolvator Co., North Bergen, N. J. (Booth 303)

Tote Pan

The Stack-n-Nest pan is molded from one piece of fiber glass reinforced polyester.

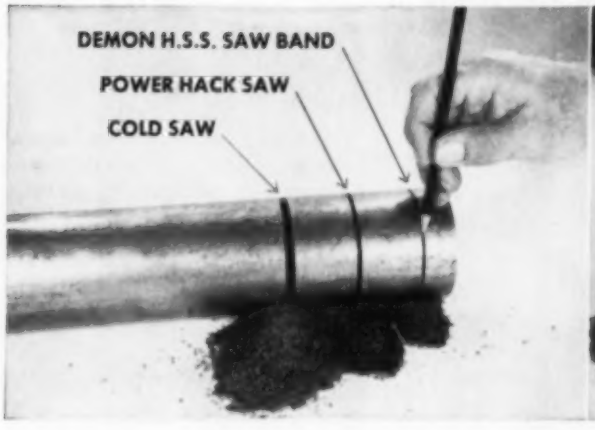
It will not rust and is impervious to water, oil and many chemicals. The container stacks and nests. G. B. Lewis Co., Watertown, Wis. (Booth 422)

Conveyors

The "Flow Bench" is a new, live-roller conveyor unit. Rollers can be removed and replaced by a platform work station at any interval. Used with "live storage" racks, the conveyor cuts down the work in process on most operations.

The "Flow Rack" is used for live storage. It consists of steel channel tracks and recessed conveyor wheels. Units can be used sep-

Material Savings Pay For This New Cut-Off Tool!



Thin Demon High-Speed Steel Saw Bands* Waste Less, Cut Faster, Last Longer

Demon Bands have high red heat hardness. They cut up to 10 times faster, last up to 30 times longer than ordinary saw bands. They take cutting loads that would "burn up" ordinary blades.

DoALL Power Saw—a full automatic sawing machine designed solely to take full advantage of DoALL Demon Blades—get the facts today.

DoALL

If you were to cut 450 5" rounds of mild steel costing as little as 13¢ per pound, the difference between the 1/16" kerf of a Demon High-Speed Steel Saw Band and the 1/8" kerf of a hack saw blade would result in material savings that alone would pay the full price of the Demon blade.

In addition to this savings, a DoALL power saw using continuous cutting Demon Blade cuts 2 to 5 times faster than any saw of comparable price . . . blade life is several times greater . . . downtime is reduced . . . and capital investment is 1/3 to 1/4 that of other machines of comparable capacities.

The Demon blade and DoALL power saw combination is an unbeatable team for making your cut-off operation more profitable.

Get the Facts—call your local DoALL Service Store or write to:

The DoALL Company, 254 N. Laurel Ave., Des Plaines, Ill.

Send for Power Sawing Handbook—112 pages of data on how to reduce your cut-off costs. This booklet compares cut-off methods, describes the DoALL Power Saw and Demon Blade, includes users' testimonials and gives complete cut-off sawing recommendations. Yours free on request—call or write today.

*Patent Pending

58-44

38 friendly DoALL stores offer prompt service at the local level.

AUTOMATION at work ...supported by ACME Weldments

18,240 operations — 80 automobile transmission cases every hour! That adds up to quite a day's work, but it's no problem for this transfer machine built by the Baush Machine Tool Company of Springfield, Massachusetts. Unusual sectional design permits rapid retooling, keeps work handling to a minimum, and speeds production in many of America's largest automotive plants.

To provide the *strength* and *rigidity* required by this complex, automatic machine, Baush engineers specified all-welded steel bases fabricated by *Acme Welding*. Beside being stronger these Acme weldments are lighter and make possible the incorporation of many exclusive design features. Perhaps these advantages of Acme weldments are important to your product . . . whatever your requirements, why not call on Acme *today*.

A.S.M.E. U68-U69 Qualified Welders • A.P.I.-A.S.M.E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service

Send us your blueprints for a prompt quotation and ask for our informative booklet, "The FACTS about WELDMENTS and CASTINGS."

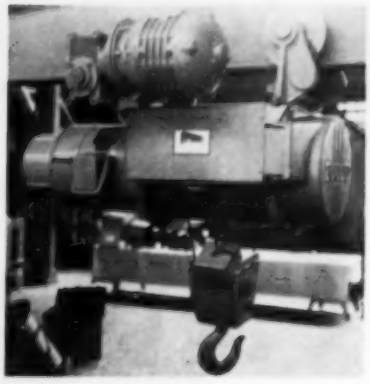
Acme WELDING
DIVISION of THE UNITED TOOL & DIE CO
1030 New Britain Ave. • West Hartford 10, Conn.

NEW PRODUCTS and equipment

arately as conveyor links between machines and for low-cost movement of extra wide materials. Rapids-Standard Co. Inc., Grand Rapids 2, Mich. (Booth 802)

Hoists

Capacities of the HB series range from 6000 to 20,000 lb. Gearing is put in cable drums, making for compactness, ruggedness and accessibility.

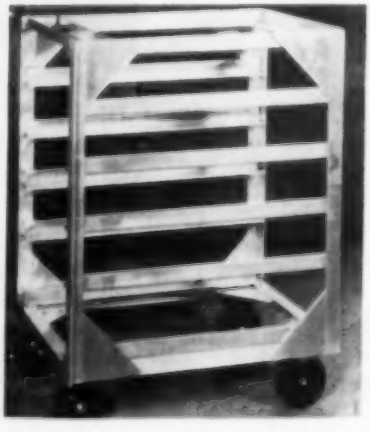


Both the planetary gearing and mechanical load brakes are in special oil-tight enclosures. Minimum safety factor is five. Euclid Crane & Hoist Co., 1365 Chardon Rd., Cleveland 17, O. (Booth 208)

Utility Rack

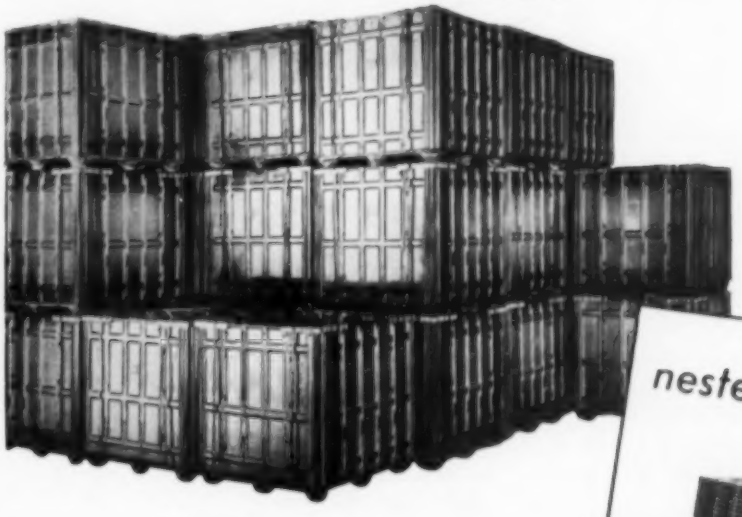
The bench-high utility rack occupies a minimum of floor space. It speeds assembly operations by saving motions during part handling.

The rack holds five trays or

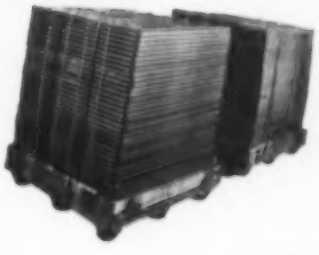


34 Ackermann BAND-BOXES...

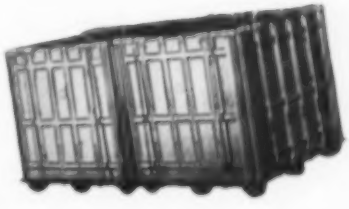
PATENT APPLIED FOR



nested for shipping...



occupy the same cubic area as 2 assembled Boxes



How do you measure the efficiency of a shipping container? Choose any shipping container, then compare it to the Ackermann Band-Box, the new light-weight, steel shipping container.

NESTABILITY? The illustration above speaks for itself. Nested, the Ackermann Band-Box occupies only 5.88% of the floor space of the assembled Boxes!

ECONOMY? The Ackermann Band-Box saves up to $3.35 per trip over other types of containers!

FREIGHT COSTS? The Band-Box cuts freight costs up to $2 per trip over other types of containers!

DURABILITY? The Band-Box will make more than 5 to-and-fro trips!

STORAGE? The Band-Box is self-palletizing, can be stacked ceiling-high without wavering!

SPEED OF ASSEMBLY? The Band-Box can be knocked-down in seconds and reassembled in a few minutes!

LABOR SAVING? The Band-Box can be loaded at the last manufacturing operation, tagged and readied for immediate shipment.

PROTECTION? The Band-Box, with full top, can be securely banded, or, if contents don't need cover protection, Stack Lock Corners permit the Band-Box to be shipped at no cost.

Only the Ackermann Band-Box gives you all these distinct advantages! It's the ideal shipping container for all inter-plant shipping and storing! Write, wire or call for the complete savings story!

ACKERMANN WHEELING

ACKERMANN MANUFACTURING COMPANY

WHEELING, WEST VIRGINIA

boxes of parts on angle ledges. Crescent Metal Products Inc., 18901 St. Clair Ave., Cleveland 10, O. (Booth 117)

Steel Mill Trucks

The K-48 line of electric powered trucks has load capacities from 18,000 to 30,000 lb. They can be equipped with forks, a ram or a hydraulically operated split ram.

The lift channels are mounted between the wheels. Trucks can be equipped with a 5-degree-backward and 3-degree-forward tilt feature.

All trucks have dual operating controls on either side to give maximum visibility. Yale Materials Handling Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. (Booths 1004, 1212)

POPE PRECISION SPINDLES for BORING • GRINDING • MILLING

An exhibit of the latest and finest in Spindle design and performance, to reduce your tolerances and production costs.

You can specify POPE PRECISION SPINDLES with Confidence

EXHIBIT A

POPE SUPER-PRECISION, HEAVY DUTY BORING SPINDLES for boring holes round within millionths of an inch. Available in both belt driven and motorized units to meet a wide range of speeds and horsepower. Send us your specifications for quotations.

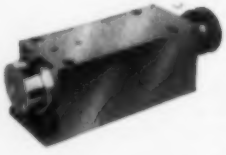


EXHIBIT B

POPE 1 HP, TOTALLY ENCLOSED 3600 RPM MOTORIZED, CARTRIDGE TYPE PRECISION SPINDLES with double row cylindrical roller bearings and separate thrust bearings for no endwise movement of the shaft

EXHIBIT D

POPE HEAVY DUTY, ¾ TO 100 HP DIRECT MOTORIZED SPINDLES for Horizontal or Vertical Skin Milling, Grinding, Milling, Boring and Other Operations

EXHIBIT F

POPE HEAVY DUTY VEE-BELT DRIVEN, PRECISION MILLING SPINDLES, and Wheel Heads, ½ to 50 HP

EXHIBIT G

POPE INTERNAL GRINDING SPINDLES for Bryant, Excello, Heald and Landis Grinders.

EXHIBIT C

NEW POPE QUICK, SELF-REMOVING WHEEL HOLDER for surface grinders and tool and cutter grinders — eliminates the necessity of a wheel puller. Write for quotations.

EXHIBIT E

POPE SUPER-PRECISION MOTORIZED TOOL AND CUTTER GRINDER SPINDLES with clearance Angle Swiveling Heads for Angular Adjustment in A Vertical Plane

EXHIBIT H

POPE SUPER-PRECISION HIGH FREQUENCY HEAVY DUTY GRINDING AND MILLING SPINDLES for speeds up to 100,000 RPM

WRITE FOR COMPLETE SPECIFICATIONS, PRICE AND DELIVERY

No. 110

POPE MACHINERY CORPORATION
261 River Street
Haverhill, Massachusetts
Established 1920

Builders of the Revolutionary New POPE Super-Precision Boring Machine That Bores Holes Round Within Millionths of an Inch.

Lift Truck

The Model HX foot-operated hydraulic unit is designed for easier handling of pallet loads. The model shown has a capacity of

2000 lb. Other models have 4000 and 6000-lb capacities. Barrett-Cravens Co., 630 Dundee Rd., Northbrook, Ill. (Booths A1009, A1011)

Pallets

Zeferwate shipping pallets permit four-way entry. Patented block support construction reduces shipping weight and lowers costs. The pallets may be discarded after one use.

Though the pallet is light, block supports placed at critical strain points make them strong enough to be re-used. Acme Pallet Co. Inc., 15 Park Row, New York 38, N. Y. (Booth 710)

Pullers

The line of Cum-a-Long pullers has models which range from ¾ to 5 tons in capacity. They have absolute load control to within 1/32-in.

The 5-ton model has a 5-ft lift and weighs less than 60 lb. All models will operate at any angle or position, including upside down. Ohio Hoist & Mfg. Co. Inc., Lisbon, O. (Booth 312)

Metal Framing

Unistrut is a system of adjustable metal framing and mechanical supports for building pallet racks, bar stock racks, general storage

See Cleveland Tramrail's Big Exhibit

at the
Material Handling Institute's
Exposition of 1956
Public Auditorium
Cleveland

JUST a few easy steps from the main entrance to the show will be Cleveland Tramrail's big exhibit.

In the 76 foot long space you will find a wide array of overhead materials handling equipment in operation. You will be able to see and study first hand what makes Cleveland Tramrail equipment so outstanding that over 9,000 plants in the United States and Canada have more than 40,000 installations of it for lightening the work and speeding production.

You will see important new items and improvements:

New Manually-Operated Switch

Heavy slide rod construction enables smoother operation. More positive lock mechanism. Wearing parts including track sections easily replaced.

New Switch Motorization

Rugged, simplified construction assures trouble-free track switch operation.

New Tractor

Powerful unit with greater wheel traction. Heavier gearing, more easily reached, requiring removal of only one gear cover.

New "Power and Free" Attachment

New tractor attachment releases drive wheels from track. Permits easy tractor movement during manual propulsion. Valuable for many automatic handling systems.

New Roll Grab

Hydraulic operation. Smoother running. More positive grip. Fewer moving parts, easier to reach. Handles rolls in vertical or horizontal position and turns from one to the other. Grab on exhibit handles rolls to 6000 lbs., from 24 to 60 inch diameter, from 36 to 84 inch long.

Cleveland Tramrail Division
The Cleveland Crane & Engineering Co.
Wickliffe, Ohio

CLEVELAND TRAMRAIL

SOAKING PIT COVER CONTROL

REMOTE CONTROLS

Operate cranes, remove pit covers, monitor motors, send warning signals, etc.

TROLLEYPHONES

Voice communication between crane cabs and floor, mine locomotives and dispatcher.

AUDIOPHONES

Wired voice systems installed anywhere in industry. Common talking or selective.

Unique Femco control selects and operates up to 50 separate covers — automatically from a control panel in the soaking pit crane! Applicable to many different layouts and types of pits.

GET THE FACTS — SUBMIT YOUR PROBLEM FOR A PROPOSAL.

Femco Inc.
IRWIN, PENNSYLVANIA
UNderhill 3-3200

Specialists in Electronic Communication and Automation

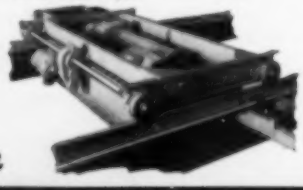
Overcoming Headroom Limitations with a LOW HEADROOM TROLLEY
EUCLID CRANE

• Rapid growth of a progressive company necessitated the installation of a larger, more powerful crane.

Headroom limitations prevented the use of a conventional crane without expensive lowering of the runway which would have restricted the working height under the hook.

Euclid engineers solved the problem by incorporating standard units into this compact yet accessible low headroom trolley.

Regardless of your needs for material handling equipment a standard or specially designed Euclid Crane or Hoist will meet the requirements satisfactorily.



Write for Literature

THE EUCLID CRANE & HOIST CO.
1365 CHARDON ROAD • CLEVELAND 17, OHIO

NEW PRODUCTS and equipment

racks, partitions, display racks and shelving.

It consists of metal channels in 11 sizes and gages, framing fittings, brackets, clamping nuts and bolts. Unistrut Products Co., 1013 Washington Blvd., Chicago 7, Ill. (Booth 304)

Hopper Boxes

Flow - Matic boxes are handled easily by lift trucks. As the box is lowered into the hopper stand, the door opens automatically, and the box tilts to discharge parts.

The door closes to shut off material flow as the box is raised. Powell Pressed Steel Co., Hubbard, O. (Booth 504)

Lift Truck

Patterned after the Hyster RC-SC lift truck series, the TC-200 features convenient, easy-to-operate controls and wide visibility. Capacity is 20,000 lb at 24-in. load centers.

Maximum stability and rigidity under capacity loads result from the unit's exclusive overhead tilt-

How forged weldless rings and flanges...
improve your product and cut your costs
Standard Steel Works Division
BALDWIN-LIMA-HAMILTON

get this informative booklet, free!

When you consider a change in your product, you expect that change to make money for you or to save money for you.

It's quite possible that Standard Steel forged weldless rings and flanges will do *both*.

They improve your product, thus making your sales task a little easier, and they cut your manufacturing costs. In many cases, first cost may be less than the component you now use, and invariably machining time is less.

From this little booklet, you can see in five minutes how Standard Steel forged rings and flanges will fit into *your* picture. Send the coupon now.

STANDARD STEEL WORKS DIVISION
BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Hamilton • Electronics & Instrumentation • Lima • Madsen • Loewy-Hydropress • Pelton • Standard Steel Works

Dept. 8646, Standard Steel Works Division
Baldwin-Lima-Hamilton Corporation, Burnham, Penna.

Without any obligation on my part, send me your bulletin 10,500.

NAME _____ TITLE _____

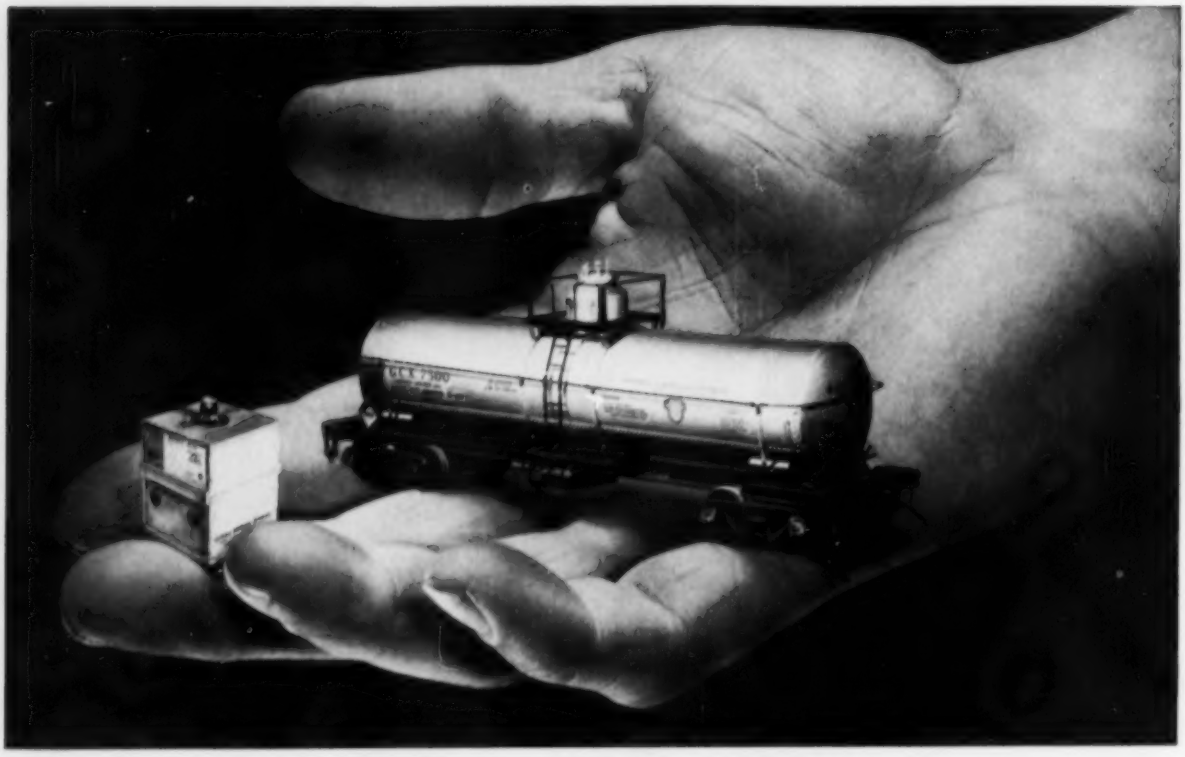
COMPANY _____

STREET ADDRESS _____

CITY _____ ZONE _____ STATE _____

B-2391

use acids?



Your best source always is GENERAL CHEMICAL...

SULFURIC
BATTERY (Sulfuric-Electrolyte)
SULFAN® Stabilized Sulfuric Anhydride
OLEUM (Fuming Sulfuric)
MURIATIC (HYDROCHLORIC)
OXALIC
ACETIC
PHOSPHORIC
NITRIC
MIXED
HYDROFLUORIC, ANHYDROUS
HYDROFLUORIC, AQUEOUS
FLUOBORIC
FLUOSULFONIC
and many other inorganic acids in commercial and reagent grades

Allied Chemical

America's Primary Producer Since 1899

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte • Chicago Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo • Los Angeles Milwaukee • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle St. Louis • Yakima (Wash.)

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

ing mechanism and new, heavy-duty uprights.

A Hercules gasoline engine powers the truck; factory installation of diesel drive is optional. Travel speed is more than 20 mph in forward or reverse; vacuum-powered brakes ease braking effort. Centerpoint steering and an outside turning radius of 179 in. make the unit highly maneuverable.

Over-all compactness is characterized by a length of 166½-in. and a width of 94 in. Tires are 9:00 x 20, 12 ply with lug treads. Hyster Co., 2902 Clackamas St., Portland 8, Oreg. (Booths 1116, 1422)

Hydraulic Crane

The indoor-outdoor crane has a telescopic boom that can be raised to about 45 degrees from the horizontal. The boom can be rotated through 360 degrees.

With outriggers, the crane will handle loads up to 10,000 lb. Top road speed is about 20 mph.

Maximum reach is 24 ft., minimum is 6½-ft. Construction Equipment Division, Austin-Western Co., Baldwin-Lima-Hamilton Corp., Aurora, Ill. (Booth 1405)

Industrial Casters

Triple, grease-sealed casters in the 900GS series have positive seals around all bearing areas.

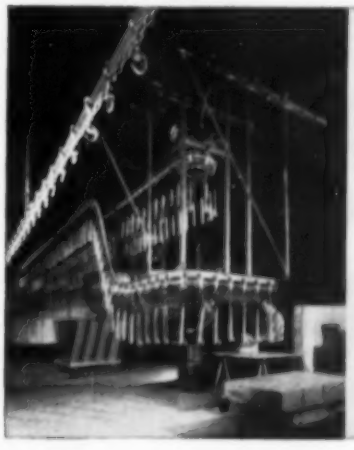
The casters are designed to reduce maintenance when they are exposed to water, chemicals or dirt. Faultless Caster Corp., 1521 N. Garvin St., Evansville, Ind. (Booth 509)

. . . to reduce product handling costs in *your* plant!

WHEN A-F Conveying Engineers confer over a drawing board your products-handling problems get the *specialized* professional attention they deserve. For A-F founded the package conveyor business in 1901; has engineered every type of conveying system for every type of industry.

And, as industry moves more and more to automation, its leaders depend more and more on A-F *Engineered* Plant-Wide Conveying Systems to make the one kind of savings now possible—Operational savings!

Before your plant orders any type of conveyor, write us. We'll be glad to submit an estimate. In many cases we will be low. In any case—you can be sure your A-F *Engineered* Conveying System will be right!



This compact A-F Engineered Conveying System moves shelving brackets from loading station to paint dip tanks (4 movable tanks, side by side, provide 4 easily positioned colors) while other formed parts are carried to spray booth, sprayed, then carried into in-process drying and live storage on inner concentric track loops to be delivered dry and ready for shipment at unloading station. There are many other features of this A-F Engineered installation that may interest you—fully illustrated—as are other installations, some of them fully automatic—in a new 32 page A-F *Engineered* Overhead Trolley Conveyor book.

Write for your FREE copy today

YOU CAN SEE THE SUPERIORITY OF A-F CONVEYOR ENGINEERING

A-F

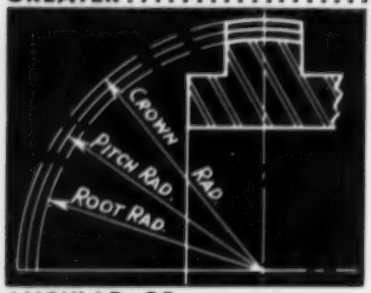
A-F *ENGINEERED* CONVEYING SYSTEMS

Also Pre-Engineered Conveyors—Wheel, Trolley, Roller, Belt

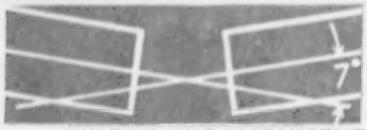
Metal Cleaning and Processing Machines

THE ALVEY-FERGUSON CO., 571 Disney Street, CINCINNATI 9, OHIO and Azusa, Cal.

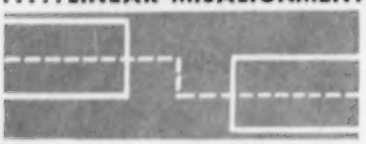
PERFECT SPHERICAL TOOTH FORMATION PERMITS GREATER.....



ANGULAR OR.....



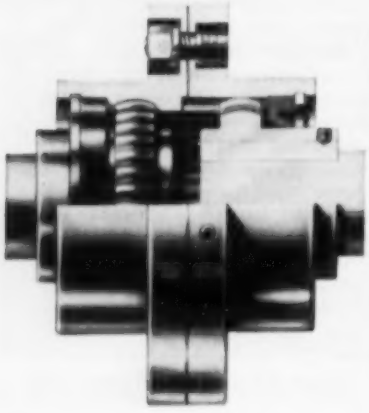
.....LINEAR MISALIGNMENT



The Philadelphia SPHEREFLEX COUPLING features a Spherical cut tooth which allows a ball and socket action between mating teeth up to 14° angular misalignment—and due to this angular capacity, a much greater amount of parallel misalignment is possible, which varies directly as the pitch diameter of the gears. All this is accomplished by gearing having a minimum back-lash.

By using Sphereflex Couplings, you can eliminate excessive bearing loads and cyclical bending stresses, which are caused by misalignment between shafts.

Send for Catalog C-560, and be convinced.



phillie gear

PHILADELPHIA GEAR WORKS, INC.

ERIE AVE. & G STREET, PHILADELPHIA 34, PENNA.

Offices in all Principal Cities

INDUSTRIAL GEARS & SPEED REDUCERS
LIMITORQUE VALVE CONTROLS
FLUID AGITATORS • FLEXIBLE COUPLINGS

Virginia Gear & Machine Corp. • Lynchburg, Va.

1956 MATERIAL HANDLING SHOW

Cleveland's Public Auditorium will house all exhibits. Exposition hours: June 5 and 6, from 10 a.m. to 5:30 p.m.; June 7, from noon to 10 p.m.; June 8, from 10 a.m. to 5 p.m. Technical sessions will be in the auditorium the mornings of June 5, 6 and 7.

Program

June 5, 9 a.m.

James Apple, Michigan State University: "Relationship of Plant Layout to Material Handling." E. Albert Ovens, vice president, Academy of Advanced Traffic: "Traffic Management and Material Handling."

June 5, 10:45 a.m.

Alan H. Mogenson, Work Simplification Conferences: "Work Simplification and Its Use in Material Handling." George G. Raymond Jr., president, Material Handling Institute: "Management and Material Handling."

June 6, 9 a.m.

Fred V. Gardner, Fred V. Gardner Associates: "Analyzing Material Handling Costs." Andrew J. Briggs, head, Material Handling & Warehousing Branch, Department of Navy, Bureau of Supplies & Accounts: "A Simplified Approach to Stock Positioning and Space Control."

June 6, 10:45 a.m.

Grover Barkdoll, Methods Engineering Council: "Operation Analysis in Material Handling." Wilbur D. Warner, materials handling manager, Sears, Roebuck & Co.: "Distribution in Relationship to Material Handling."

June 7, 9 a.m.

Joseph W. Shimp, Marinette Paper Co.: "Paper Mill Management Looks at Material Handling." James R. Bright, Harvard University: "Managerial Problems Arising Out of Automation."

June 7, 10:45 a.m.

H. B. Maynard, president, Methods Engineering Council: "Work Measurement and Material Handling." Dr. Lillian Gilbreth, president, Gilbreth Inc.: "The Relationship of Industry to Education and Training."

Exhibitors

EXHIBITOR	BOOTH
Acme Pallet Co. Inc., New York	710
Acme Steel Product Division, Acme Steel Co., Chicago	1610
Albion Industries Inc., Albion, Mich.	1339
Algene Marking Equipment Co., Garfield, N. J.	227
Allen Industrial Products Inc., Battle Creek, Mich.	1337
Allied Mfg. & Sales Co., division of Grand Specialties Co., Chicago	1402
Alvey-Ferguson Co., Cincinnati	1132
American Chain & Cable Co., Bridgeport, Conn.	A1001
American Machinist, New York	1316
American MonoRail Co., Cleveland	1419
American Pulley Co., Philadelphia	1027
Anchor Coupling Co., Libertyville, Ill.	207
Anchor Steel & Conveyor Co., Dearborn, Mich.	A1008
Apparatus Sales Division, General Electric Co., Schenectady, N. Y.	1032
Artco Corp., Flourtown, Pa.	A1014
Austin-Western Works, Construction Equipment Division, Baldwin-Lima-Hamilton Corp., Aurora, Ill.	1405

TOOL WEAR...–75%
MACHINING SPEED...+100%
ON THIS GRAY IRON RING

...thanks to
FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE... because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 53, Niagara Falls, N.Y. 54-53

CARBORUNDUM®

600
AIR-CONDITIONED
Guest Rooms

NOW you can be *sure* of an air-conditioned room when you come to Baltimore! Teletype: BA 263.

The Lord Baltimore
HOTEL

EXHIBITORS

EXHIBITOR	BOOTH
Automatic Transportation Co., Chicago	1234, 1332
Automation, Cleveland	415
Baker-Raulang Co., Cleveland	908, 1432
Ballymore Co., Wayne, Pa.	501
Barrett-Cravens Co., Northbrook, Ill.	A1009
Bassick Co., Bridgeport, Conn.	505
Belt Corp., Orient, O.	A1002
Benton Harbor Engineering Works Inc., Benton Harbor, Mich.	A1017
Berg-Gibson Mfg. Co., Kansas City, Mo.	1030
Better Packages Inc., Shelton, Conn.	310
Bond Foundry & Machine Co., Manheim, Pa.	124
Brainard Steel Division, Sharon Steel Corp., Warren, O.	A1029
Broderick & Bascom Rope Co., St. Louis	703
Buda Division, Allis Chalmers Co., Milwaukee	1612
E. W. Buschman Co., Cincinnati	113
C & D Batteries Inc., Conshohocken, Pa.	1444
C.I.T. Corp., New York	507
Cascade Mfg. Co., Portland, Oreg.	1326
Chain Belt Co., Milwaukee	410
Chainveyor Corp., Los Angeles	322
Chester Hoist Division, National Screw & Mfg. Co., Lisbon, O.	A1016, 1018
Chicago Tramrail Corp., Chicago	1411
Chilton Co., Philadelphia	219
Chisholm Moore Hoist Division, Columbus McKinnon Chain Corp., Tonawanda, N. Y.	302
Cleveland Tramrail Division, Cleveland Crane & Engineering Co., Wickliffe, O.	216
Coffing Hoist Division, Duff-Norton Co., Danville, Ill.	109
Coles Cranes Inc., Joliet, Ill.	1630
Colson Corp., Elyria, O.	1021
Colson Equipment & Supply Co., Los Angeles	128
Conover-Mast Publications Inc., New York	611
Construction Machinery Division, Clark Equipment Co., Battle Creek, Mich.	1436
Crescent Metal Products Inc., Cleveland	117
Dempster Bros. Inc., Knoxville, Tenn.	909
Dexion Division, Acme Steel Co., Chicago	1628
Doerr Electric Corp., Cedarburg, Wis.	1435
Electric Products Co., Cleveland	1427
Electronics Division, General Electric Co., Syracuse, N. Y.	205
Electronics & Instrumentation Division, Baldwin-Lima-Hamilton Corp., Philadelphia	1405
Elwell-Parker Electric Co., Cleveland	1020
Equipment Mfg. Co., Detroit	A1013
Euclid Crane & Hoist Co., Cleveland	208
Exide Industrial Division, Electric Storage Battery Co., Philadelphia	414
Fab-Weld Corp., Philadelphia	1136
Factory Management and Maintenance, New York	426
Fairbanks Co., New York	116
Faultless Caster Corp., Evansville, Ind.	509
Harry J. Ferguson Co., Jenkintown, Pa.	A1020
Field Engineering Co., Jamestown, N. Y.	105
Flow Magazine, Cleveland	119, 1104
Foundry, Cleveland	415
Gar Wood Industries Inc., Wayne, Mich.	906
General Box Co., Des Plaines, Ill.	215
Gerlinger Carrier Co., Dallas, Oreg.	1406
Globe Hoist Co., Philadelphia	1106
Gould-National Batteries Inc., Trenton, N. J.	1425
Grand Specialties Co., Chicago	1402
J. W. Greer Co., Wilmington, Mass.	318
Harnischfeger Corp., Milwaukee	1502
Hapman Conveyors Inc., division of Hapman-Dutton Co., Kalamazoo, Mich.	A1006
Hercules Motor Corp., Canton, O.	510
Hertner Electric Co., Cleveland	120
Hughes-Keenan Corp., Delaware, O.	121
Hyster Co., Portland, Oreg.	1116, 1422
Industrial Equipment News, New York	106
Industrial Truck Division, Clark Equipment Co., Battle Creek, Mich.	1426
Ingersoll Kalamazoo Division, Borg-Warner Corp., Kalamazoo, Mich.	1312
Ironbound Box & Lumber Co., Hillside, N. J.	407
Island Equipment Corp., Long Island City, N. Y.	1403

WIN $2000.00 IN THE WENDT-SONIS TOOL HOLDER "CUT COSTS" CONTEST

New! Different! Interesting! Easy too . . . and you win two ways in the Wendt-Sonis "Cut Costs" Contest. Who's eligible? Anyone employed by a company using the new superior Wendt-Sonis tool holder for throw-away inserts — a proven cost cutter. Keep a record on how you did it — how you "cut costs." Enter the facts on a simple-to-fill-out entry blank — send it to Wendt-Sonis Company for a chance at the prizes. Contest closes June 30, 1956. You win two ways — a chance at the prize — your job done at lower cost with Wendt-Sonis tool holders for throw-away inserts.

briefly — here's all you do . . .

1. Use the coupon below to get your entry blank and clear-cut easy-to-understand contest rules.
2. Be sure you have Wendt-Sonis tool holders for throw-away inserts on your job.
3. Jot down the facts and figures on the job for filling in the standard entry blank. You can base your example on lower tooling costs . . . less downtime . . . more parts per hour . . . *all* of these three . . . or any other savings you accomplished with Wendt-Sonis tool holders for throw-away inserts. Don't worry about neatness, spelling or size and type of job. Enter more than one job if you wish!

Don't be concerned about our using your name or company name in advertising. We wouldn't do that without getting your permission first.

$5000.00 IN PRIZES

1st $2000.00
2nd $1000.00
3rd $ 500.00
4th $ 250.00
and 25 $50 PRIZES
for
DOING YOUR JOB BETTER . . . AT LOWER COST

CONTEST JUDGES

John Grove
Executive Editor
Tool Engineer

Jerome S. Wilford
Executive Editor
Production Magazine

Elmer J. Yongerman
Executive Editor
American Machinist

GET YOUR SIMPLIFIED ENTRY BLANK RUSH!

CLIP — mail now!

"Cut Costs" Contest
Wendt-Sonis Co.
Dept. SM-556, Hannibal, Mo.

I want a chance to win in the Wendt-Sonis Tool Holder "Cut Costs" Contest. Rush me rules and entry blank.

COUNT ME IN!

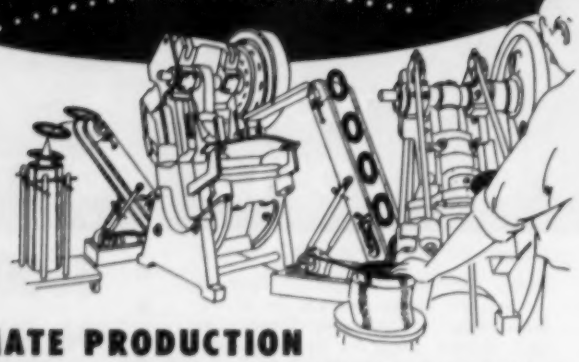
NAME _____ POSITION _____

FIRM _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

HOMER MAGNETIC CONVEYORS AND MAGNETIC SHEET SEPARATORS



AUTOMATE PRODUCTION
CUT LABOR COSTS—REDUCE REJECTS
in handling ferrous parts and scrap

Homer "Space Saver" Permanent Magnetic Conveyors cut costs by automatically feeding machines . . . stacking parts . . . transferring parts between machines . . . and performing parts turn-over and other handling operations.

"Space Savers" convey ferrous parts at angles up to 90° without belt cleats, buckets or holding devices. The powerful magnetic assembly securely holds and conveys—ends loss of parts from belt as a result of belt resilience or bouncing over belt cleats—prevents damage to critical finishes caused by parts riding against cleats or jamming in flapper gates.

"Space Saver" Conveyors save floor space because their steeper inclines (up to 90°) without nosed-over delivery . . . and resulting shorter length permit closer grouping of machinery. "Space Savers" have outstanding loading flexibility—any angle, any height above floor . . . from other conveyors, chutes or production machines. Pick up pieces from floor if required. Standard and Custom models available . . . Write for Bulletin MC-250.

HOMER PERMANENT MAGNETIC SHEET SEPARATORS

Speed handling of steel sheets and pieces. Prevent scratching or marring of surfaces in handling. As each piece is removed, next piece rises clear of stack for easy handling. Write today for Bulletin SS-210.

THE HOMER MANUFACTURING CO., INC.

DEPT. 149 **LIMA, OHIO**

HOMER FIRST IN INDUSTRIAL PERMANENT MAGNETIC CONVEYORS

EXHIBITORS

K. W. Battery Co., Skokie, Ill. A1015
Kalamazoo Division, New York Air Brake Co., New York 1126
Kalamazoo Mfg. Co., Kalamazoo, Mich.. 1034
Kelley Co. Inc., Milwaukee 512
Knickerbocker Co., Jackson, Mich. 904
Koehring; Kwik-Mix Co., Milwaukee 1429

Lamson-Mobilift Corp., Syracuse, N. Y... 1028
Landahl Conveyor Co., subsidiary of American MonoRail Co., Cleveland .. 1419
G. B. Lewis Co., Watertown, Wis. 422
Lewis-Shepard Products Inc., Watertown, Mass. 228, 1012
Liftequip Co., Cleveland 401
Lift Trucks Inc., Cincinnati 702
Louden Machinery Co., Fairfield, Iowa.. 1015
Loomis Machine Co., Clare, Mich. 806

Machine Design, Cleveland 415
Magline Inc., Pinconning, Mich. 101
Magnesium Co. of America, East Chicago, Ind. 1218, 1335
Mansaver Industries, New Haven, Conn. 411
Market Forge Co., Everett, Mass. A1019
May-Fran Engineering Inc., Cleveland.. 807
Mechanical Handling Systems Inc., Detroit 1015
Mercury Mfg. Co., Chicago 1003
Modern Caster Co., Rockford, Ill. 204
Modern Materials Handling, Boston 320, 609
Morse Chain Co., Ithaca, N. Y. 1201
Moto-Truc Co., Cleveland 416, 417
Motor Generator Corp., Troy, O. 1130

New Equipment Digest, Cleveland 415
Nutting Truck & Caster Co., Faribault, Minn. 513

Ohio Galvanizing & Mfg. Co., Niles, O.. 217
Ohio Hoist & Mfg. Co., Lisbon, O. 312
Ohio Honing & Hydraulic Co., Cleveland.A1012
Orangeville Mfg. Co., Orangeville, Pa...A1021
Oster Mfg. Co., Cleveland 1608

Parker Appliance Co., Cleveland 1102
The Penton Publishing Co., Cleveland .. 415
Pittsburgh Steel Products Co., Pittsburgh 500
Plant Engineering, Chicago 1202
Powell Pressed Steel Co., Hubbard, O... 504
Power-Line Sales Inc., Monterey Park, Calif. 714

Rack Engineering Co., Connellsville, Pa. 808
Radio Corp. of America, New York 125
Rapids-Standard Co. Inc., Grand Rapids, Mich. 802
Raymond Corp., Greene, N. Y. 1122, 1228
Ready-Power Co., Detroit 1409
Republic Steel Corp., Cleveland 900
Revolvator Co., North Bergen, N. J. ... 303
Richards-Wilcox Mfg. Co., Aurora, Ill... 402
Robbins & Myers Inc., Springfield, O... 1417
Ross Carrier Division, Clark Equipment Co., Benton Harbor, Mich. 1416
David Round & Son Inc., Cleveland 403
Rowe Methods Inc., Cleveland 301
Ruger Equipment Inc., Uhrichsville, O. .. 108

Sage Equipment Co., Buffalo 1240
Saginaw Products Corp., Saginaw, Mich..A1025
Service Recorder Co., Cleveland 225
Service Supply Corp., Philadelphia 1036
Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y. 102
Silent Hoist & Crane Co., Brooklyn, N. Y. 326
Spaulding Fibre Co. Inc., Dover, N. H... 1328
Stackbin Corp., Pawtucket, R. I. 202
Stanley Works, New Britain, Conn. 1011
STEEL, Cleveland 415
Stephens-Adamson Mfg. Co., Aurora, Ill. 316
Sterling Bolt Co., Chicago 701
Storage Battery Division, Thomas A. Edison Inc., West Orange, N. J. 901

G. H. Tennant Co., Minneapolis 705
Thomas' Register, New York 108
Thomas Truck & Caster Co., Keokuk, Iowa 907
Tote System Inc., Beatrice, Nebr. 1330
Towmotor Corp., Cleveland ..1112, 1206, 1301

Union Metal Mfg. Co., Canton, O. 608
Union Steel Products Co., Albion, Mich.. 1317
Unistrut Products Co., Chicago 304

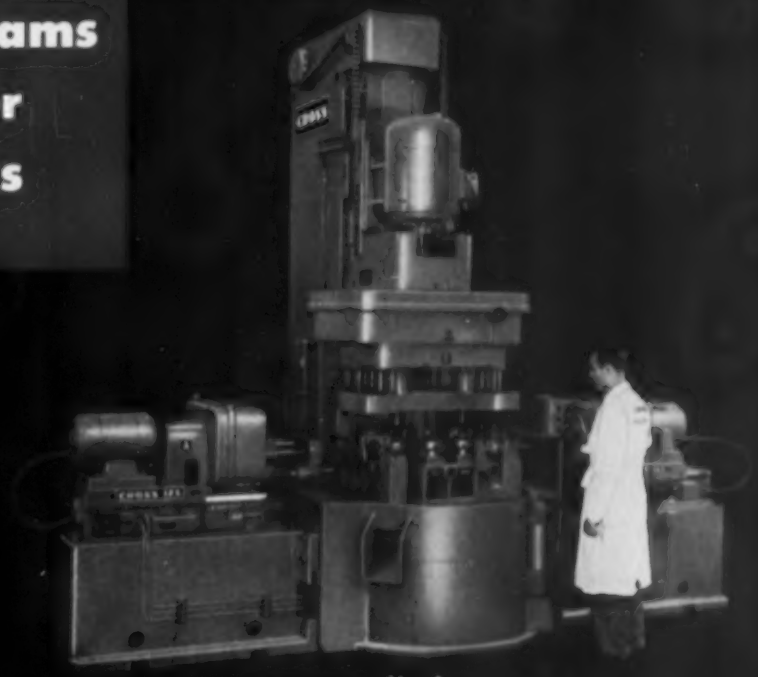
Vickers Inc., Detroit 1415

Waukesha Motor Co., Waukesha, Wis. .. 801
Jervis B. Webb Co., Detroit 110
Weber Marking Systems, division of Weber Addressing Machine Co. Inc., Mt. Prospect, Ill. 708
West Bend Equipment Corp., West Bend, Wis. 210
Whiting Corp., Harvey, Ill. 1029

Yale & Towne Mfg. Co., Philadelphia 1004, 1212

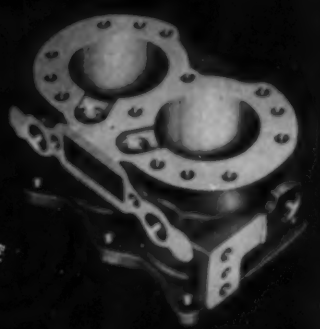
More Specials by Cross

Bores, Drills, Chamfers and Reams Air Compressor Cylinder Blocks



No. 1

No. 2



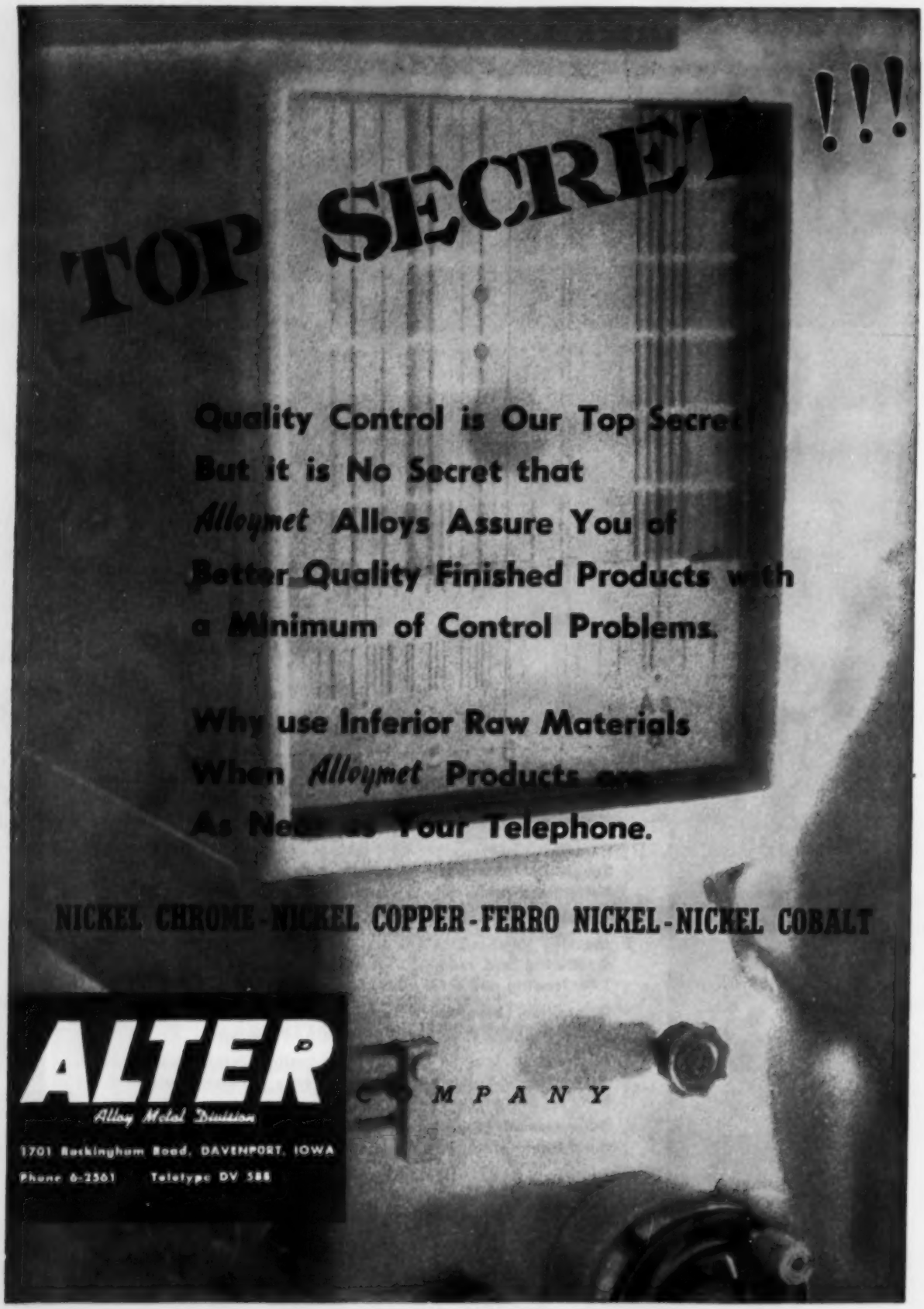
- ★ Rough and semi-finish bores cylinders; rough and finish counterbores valve ports; drills, chamfers and reams all holes.
- ★ 129 pieces per hour at 100% efficiency.
- ★ Machine Number One has 4 stations; 1 for loading, 3 for drilling, chamfering and reaming. Machine Number Two has 7 stations: 1 for loading and 6 for machining.
- ★ 2 position, progressive type work holding fixtures for both machines, each arranged to handle 6 similar parts.
- ★ All parts in Cross machines—even tooling details—are made to interchangeable tolerances for fast, easy maintenance and flexibility for part design changes.
- ★ Other features: Construction to JIC standards; hydraulic feed and rapid traverse; hardened and ground ways; automatic work cycle.

Established 1898

THE CROSS CO.

First in Automation

DETROIT 7, MICHIGAN


TOP SECRET !!!
Quality Control is Our Top Secret!
But it is No Secret that
Alloymet Alloys Assure You of
Better Quality Finished Products with
a Minimum of Control Problems.
Why use Inferior Raw Materials
When Alloymet Products are
As Necessary As Your Telephone.
NICKEL CHROME-NICKEL COPPER-FERRO NICKEL-NICKEL COBALT
ALTER
Alloy Metal Division
1701 Rockingham Road, DAVENPORT, IOWA
Phone 6-2561 Teletype DV 588
MPANY

STEEL

May 28, 1956

Market Outlook

SOMETHING of a mixed situation is developing in the steel markets. Elements of strength and weakness are present.

While over-all demand continues to keep the mills operating close to capacity, pressure for third quarter shipments, chiefly for the light, flat-rolled products and bars, is noticeably easier. This is serving to intensify, to some extent, the market uncertainty attending forthcoming steel wage negotiations.

WEAKNESS OFFSET— In the main, the factors for strength offset those for weakness. Except for the automotive industry, major consuming lines have not severely reduced their steel intake. Even the auto builders are taking heavy tonnage. There have been some reductions on farm implement account, and minor adjustments in ordering are reported for appliance makers.

Otherwise, pressure for steel, especially plates, shapes and tubular goods, continues unabated. There has been no letup in tin plate requirements. Sales of galvanized sheets, nails and certain other products are rising seasonally.

SLOWER PACE SEEN— Even though a steel strike should be averted at midyear, steelmaking operations will slip this summer. Due to vacations and furnace repairs, ingot production is likely to drop in July. Consumers' requirements also will be off seasonally.

Reflecting the strong current situation, the national ingot rate last week held unchanged at 96.5 per cent of capacity. Were it not for the railroad strike at U. S. Steel's Birmingham plants, national ingot operations would be close to full capacity.

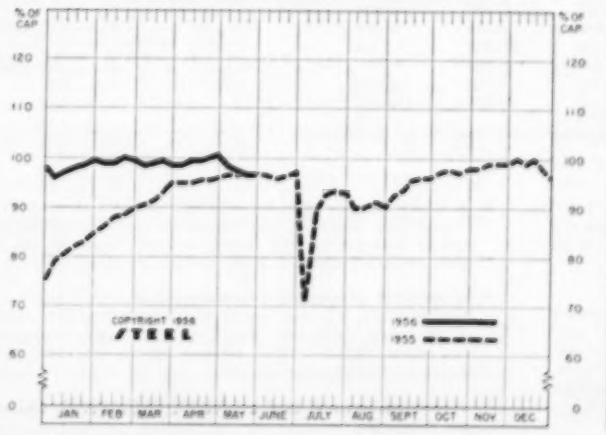
CAUTIOUS NOTE— A more cautious attitude with respect to forward ordering prevails among consumers. Third quarter specifications are coming in to the mills in good volume, and customers indicate they will take their full July-August allotments. But, except for plates and shapes, and possibly tin plate, in the major products, there are no definite assurances all the tonnage offered will be taken on schedule.

The disappointing spring showing in automobiles has tempered optimism in the economy generally. This is being reflected among steel buyers in increasing degree. While the tapering in auto production continues, an encouraging note is injected into the over-all steel demand picture by heavy freight car requirements. Railroad car orders in April, at 6559 units, were the largest for any month this year. The car order backlog as of May 1 was 137,436 units, against only 17,930 a year ago.

PRICES UNCHANGED—The arithmetical price composites compiled by STEEL are unchanged at $128.98 on finished steel, $61.27 on malleable pig iron, $60.27 on No. 2 foundry iron and $59.80 on basic iron. The scrap composite continues to sink, last week slipping another 83 cents to $50.17.

GRAY MARKET STIRRING—Significantly, more gray market offerings of plates and shapes are reported. Well-above warehouse prices are asked, but the increased availability is seen as possibly signifying that the gray market operators are beginning to unload.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended May 27	Change	Same Week 1955	Same Week 1954
Pittsburgh	100	0*	99.5	69
Chicago	101	+ 0.5*	98.5	84
Mid-Atlantic	98.5	0	96.5	58
Youngstown	101	0	95	68
Wheeling	101	+ 4	93	83.5
Cleveland	97.5	+ 2*	100.5	70.5
Buffalo	105	0	104.5	67.5
Birmingham	23.5	0	96	76.5
New England	89	+ 2	85	50
Cincinnati	94	— 0.5	89.5	68.5
St. Louis	99	+ 5.5	106	64.5
Detroit	93.5	— 4.5	94	69
Western	107	— 2	104	75
National Rate	96.5	0	97	70.5

INGOT PRODUCTION‡

	Week Ended May 27	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	148.1†	146.0	153.9	144.8
NET TONS (In thousands)	2,379†	2,345	2,473	2,326

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954.

Metalworking Outlook—p. 59 Material Handling Section—p. 105

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	May 22 1956	May 15 1956	Month Ago	May Average
(1947-1949=100)	158.1	158.1	157.1	158.1

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended May 22

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.175
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.243
Tie Plates	5.625	Strip, C.R., Stainless, 403 (lb)	0.444
Axles, Railway	8.350	Strip, H.R., Carbon	5.606
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.997
Plates, Carbon	5.200	Pipe, Galv., Buttweld (100 ft)	21.137
Structural Shapes	4.867	Pipe, Line (100 ft)	170.038
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	*Casing, Oil Well, Alloy (100 ft)*	*256.030*
Bars, Tool Steel, H. R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	41.530
Bars, Tool Steel, H.R., Alloy, High Speed W-18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon (100 ft)	21.360
Bars, H.R., Alloy	*9.463*	Tubing, Mechanical Stainless, 304 (100 ft)	178.857
Bars, H.R., Stainless, 302 (lb)	0.450	Tin plate, Hot-dipped, 1.25 lb	9.333
Bars, H.R., Carbon	5.500	Tin Plate, Electrolytic, 0.25 lb	8.033
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	7.133
Bars, C.F., Carbon	*5.840*	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	*12.325*	Wire, Drawn, Stainless 430 (lb)	0.590
Bars, C.F., Stainless, 302 (lb)	0.475	Bale ties (bundle)	6.537
Sheets, H.R., Carbon	5.345	Nails, Wire, 8d Common	8.595
Sheets, C.R., Carbon	6.214	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.770	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	May 23 1956	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av.=100)	210.45	210.45	209.10	194.53	171.92
Index in cents per lb	5.701	5.701	5.665	5.270	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$128.98	$128.98	$128.02	$118.45	$106.32
No. 2 Fdry Pig Iron, GT	60.27	60.27	60.27	56.54	52.54
Basic Pig Iron, GT	59.80	59.80	59.80	56.04	52.16
Malleable Pig Iron, GT	61.27	61.27	61.27	57.27	53.27
Steelmaking Scrap, GT	50.17	51.00	55.35	34.67	44.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	May 23 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.70
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.70
Bars, H.R., deld. Philadelphia	4.93	4.93	4.93	4.55	4.20
Bars, C.F., Pittsburgh	6.25*	6.25*	6.25*	5.40	4.55
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	3.65
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.65
Shapes, deld., Philadelphia	5.00	5.00	5.00	4.53	3.91
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.70
Plates, Chicago	4.50	4.50	4.50	4.225	3.70
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.225	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.70
Plates, Claymont, Del.	5.35	5.35	4.80	4.225	4.15
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.60-3.75
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.60
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.55
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.80
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.75-4.00
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.50
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.65-5.35
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.25-6.35	5.85	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	5.90	4.35-5.60
Wire, Basic, Pittsburgh	6.60	6.60	6.60	5.75	4.85-5.10
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.85	$9.85	$9.45	$9.05	$8.70

*Including 0.35c for special quality

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$66.00
Wire rods, $\frac{7}{32}$-$\frac{9}{16}$" Pitts.	5.375	5.375	5.375	4.675	4.10-4.30

PIG IRON, Gross Ton					
Bessemer, Pitts.	$61.00	$61.00	$61.00	$57.00	$53.00
Basic Valley	60.00	60.00	60.00	56.00	52.00
Basic, deld. Phila.	63.76	63.76	63.76	59.66	56.49
No. 2 Fdry, Pitts.	60.50	60.50	60.50	56.50	52.50
No. 2 Fdry, Chicago	60.50	60.50	60.50	56.50	52.50
No. 2 Fdry, deld. Phila.	64.26	64.26	64.26	55.16	56.99
No 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.33
Malleable, Valley	60.50	60.50	60.50	56.50	52.50
Malleable, Chicago	60.50	60.50	60.50	56.50	52.50
Ferromanganese, Duquesne	215.00†	215.00†	215.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$48.50	$49.50	$55.50	$34.50	$45.00
No. 1 Heavy Melt, E. Pa.	51.50	54.00	56.00	35.50	43.50
No. 1 Heavy Melt, Chicago	50.50	49.50	54.50	34.00	43.50
No. 1 Heavy Melt, Valley	53.50	53.50	59.50	34.50	45.00
No. 1 Heavy Melt, Cleve.	49.50	49.50	56.50	31.50	44.00
No. 1 Heavy Melt, Buffalo	51.50	53.50	55.50	29.50	44.00
Rails, Rerolling, Chicago	71.50	72.50	72.50	51.50	52.50
No. 1 Cast, Chicago	47.50	52.50	52.50	40.50	49.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.50
Oven, Fdry, Chicago	27.00	27.00	27.00	24.50	21.00

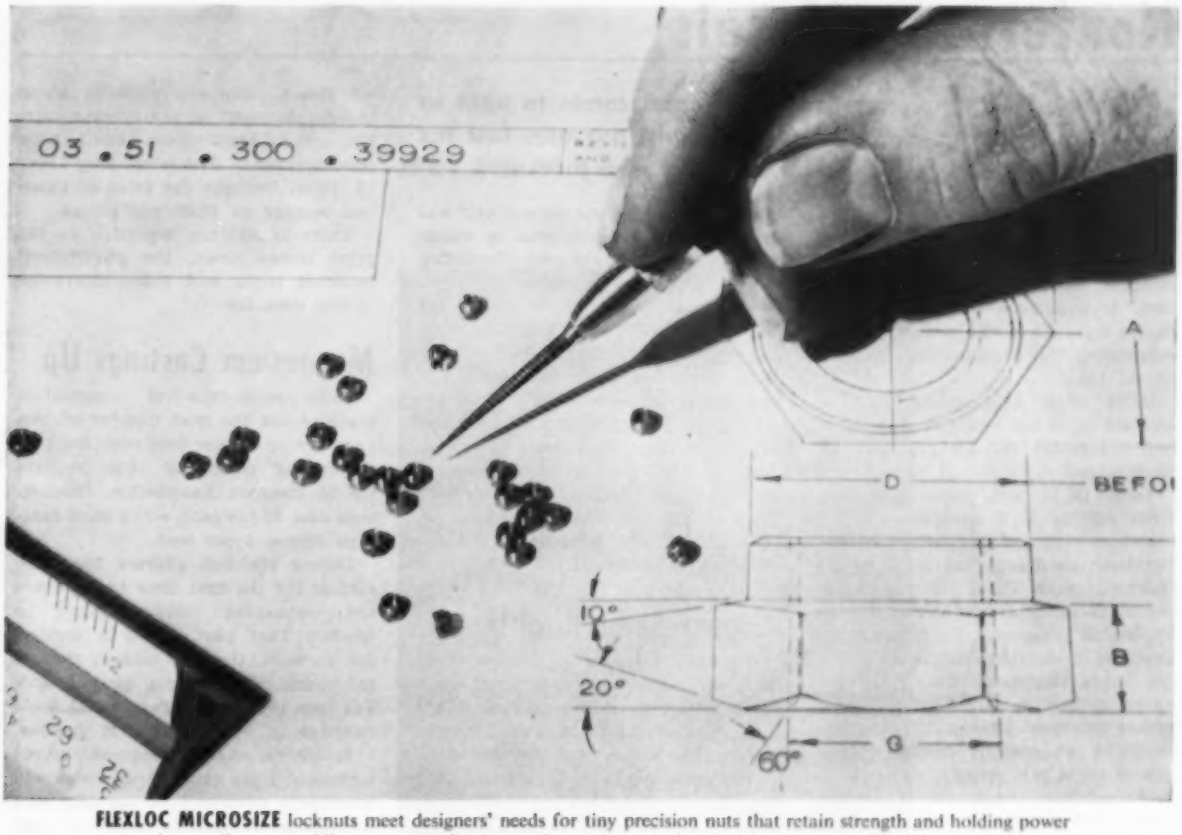
Daily Nonferrous Price Record

	May 23 Price	Last Change	Previous Price	Apr. Avg.	Mar. Avg.	May 1955 Avg.
Copper	43.00-46.00	May 23, 1956	45.00-46.00	47.500	49.727	36.000
Lead	15.80	Jan. 13, 1956	16.30	15.800	15.800	14.809
Zinc	13.50	Jan. 6, 1956	13.00	13.500	13.500	12.000
Tin	97.75	May 23, 1956	97.00	99.270	100.696	91.410
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	25.90	Mar. 29, 1956	24.40-25.90	24.650	24.650	23.200
Magnesium	33.75	Apr. 16, 1956	32.500	33.150	32.500	28.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

What You Can Use the Markets Section for:

- **A source of price information.** Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.** Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.** Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.** Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



FLEXLOC MICROSIZE locknuts meet designers' needs for tiny precision nuts that retain strength and holding power in the smallest assemblies—servomechanisms, electronic and electrical equipment, all miniature devices.

Design Lighter, More Compact Products with New FLEXLOC Microsize Locknuts

Standard Microsize Locknuts Permit Design Engineers to Develop and Fasten Smaller Assemblies Safely

SIZE	Across Flats		Shoulder Height		Across Corners	Height +.000 −.003
	MAX.	MIN.	MAX.	MIN.	MIN.	
0-80 NF-3B	.111	.107	.047	.042	.123	.075
1-64 NC-3B	.127	.123	.0635	.0585	.141	.090
1-72 NF-3B	.127	.123	.0635	.0585	.141	.090
2-56 NC-3B	.158	.153	.068	.063	.176	.105
2-64 NF-3B	.158	.153	.068	.063	.176	.105
3-48 NC-3B	.190	.183	.071	.066	.210	.120
3-56 NF-3B	.190	.183	.071	.066	.210	.120
4-40 NC-3B	.190	.183	.072	.067	.210	.120
4-48 NF-3B	.190	.183	.072	.067	.210	.120

STANDARD MICROSIZE FLEXLOCs—in sizes ranging from 0-80 to 4-48—are available in brass (either plain or cadmium plated). Consult SPS for miniature nuts of other conventional materials.

New FLEXLOC Microsize locknuts are smaller and lighter than regular FLEXLOCs of the same nominal diameter. Wrenches of smaller size are used to install them. Mating joints or flanges can be designed smaller—with no loss in strength or convenience of assembly.

Microsize FLEXLOCs have all the advantages of larger FLEXLOCs. One-piece, all-metal construction—nothing to put together, come apart, lose or forget. Use them as lock or stop nuts—they stay put anywhere on a threaded member as soon as the locking threads are fully engaged. Uniform locking torques insure accurate preloading. There are no nonmetallic inserts to pop out or deteriorate. Moisture, dryness, oil, temperatures to 250°F won't affect these Microsize FLEXLOCs. Just screw them on. They lock and stay locked. Vibration won't shake them loose.

For complete information on Microsize FLEXLOCs, consult your authorized SPS distributor. Or write STANDARD PRESSED STEEL CO., Jenkintown 33, Pa.

STANDARD PRESSED STEEL CO.

FLEXLOC LOCKNUT DIVISION SPS

JENKINTOWN PENNSYLVANIA

Nonferrous Metals

Part of the top secret Townsend report comes to light as ODM beefs up nickel expansion goals, proposes fast tax write-offs and guaranteed markets for new producers

Nonferrous Metal Prices, Pages 178 & 179

U. S. NICKEL expansion goals have been increased. Arthur S. Flemming, director, Office of Defense Mobilization, says 220,000 tons of new capacity by 1961 is the revised target, surpassing the previous objective by 30,000 tons.

ODM says this would up the amount of nickel available (imported and domestic) for all purposes by 70,000 tons.

How—ODM will issue fast tax-write offs to U. S. companies entering the nickel field. The General Services Administration is being authorized, says ODM, to "negotiate contracts under a new and additional expansion program . . . financed by Defense Production Act funds." Under these contracts, the U. S. will agree to buy specified quantities of nickel produced by new or expanded facilities at present market prices (64.50 cents per pound).

To existing producers, the words "expanded facilities" brought some assurance that the government is going to help guarantee a market for those that have already spent millions in exploration for new ore fields and millions in research to develop better processes for beneficiating nickel-bearing ores.

Outlook — 1. Look for Freeport Sulphur Co., Bethlehem Steel Co. and National Lead Co. to enter the nickel field by beneficiating low-grade Cuban ores. All three will bid on the U. S. Nicaro project this fall. 2. The government may be willing to pay premiums on nickel in the future (1957-58) to assure that stockpile objectives and military needs are met. 3. There will be a continuing shortage until 1958 if military requirements remain at present levels.

Aluminum Sales Brisk

Aluminum supply and demand are balanced despite automotive cutbacks. It is easier to get the lightweight metal, but few users have growing inventories.

Metal speculators in the New York area are still asking a 2-cent-a-pound premium on aluminum ingots (market price, 25.90 cents per pound). While there may be no takers, the practice indicates that demand is still at peak levels. The government's decision to divert 200,000 tons of aluminum during the second half was based on recommendations by industry advisory committees (including many fabricators) which still feel there could be shortages during the third and fourth quarters. Sums up one producer: "When Detroit cut back, others took up the slack. The few additional tons being made available to the market at this time can be used to experiment with new products." The Aluminum Association reports that during April, 144,726 tons of the metal were produced by U. S. primary producers. March total: 145,895 tons.

Copper Skies Bright?

Primary copper producers have sold (in some cases oversold) June copper quotas. While some users are asking that June shipments be deferred, makers of electrical equipment and wire are taking all they can get. The hesitant users are banking on a price decline and are currently using inventoried copper.

This move, which usually comes about this time of year, may be the start of LIFO worries at the end of the third quarter. If there should be a strike, inventories in users' hands will dwindle—then in October they will be screaming for copper to build up inventories for tax purposes. But at the moment some users are content to gamble that prices will fall and that there will be no strike. If there is no strike, prices could dip on the primary red metal.

Tin Sales Steady

Tin sales are moderate to good. A seasonal lull has set in in some markets, but the price continues to hover near the 97-cent-a-pound mark. In Washington, several bills are being introduced which would set up the rules for selling the government's Texas City, Tex., tin smelter. If there are no buyers by Jan. 31, 1957, the smelter could be disposed of as surplus government property.

Thoughts on Titanium

The government is willing to buy titanium at the market price. Says one producer: "It looks as though we are cutting our own throats, but we aren't. We are thinking about the development of the civilian market, and we know prices have to keep coming down." The latest drop (May 15, 1956) brought the price of titanium sponge to $3.25 per pound.

There is another benefit. As the price comes down, the government becomes more and more interested in new uses, too.

Magnesium Castings Up

Total shipments of magnesium castings for the first quarter of this year are up 27 per cent over the corresponding period of 1955, reports the Magnesium Association. Diecastings rose 10 per cent, while sand castings dipped 4 per cent.

During the first quarter, the association for the first time broke down the permanent mold category to identify that part which is anodes. As a result, the two classes showed shipments of 1629 tons, against only 642 tons reported as permanent mold castings in last year's first quarter.

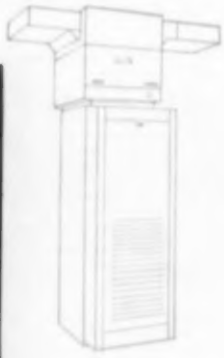
In March, sand castings shipments increased 1 per cent, permanent mold shipments advanced 25 per cent and diecasting shipments rose 25 per cent. Total shipments of all magnesium castings were 2 per cent over February.

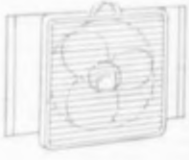
Market Memos

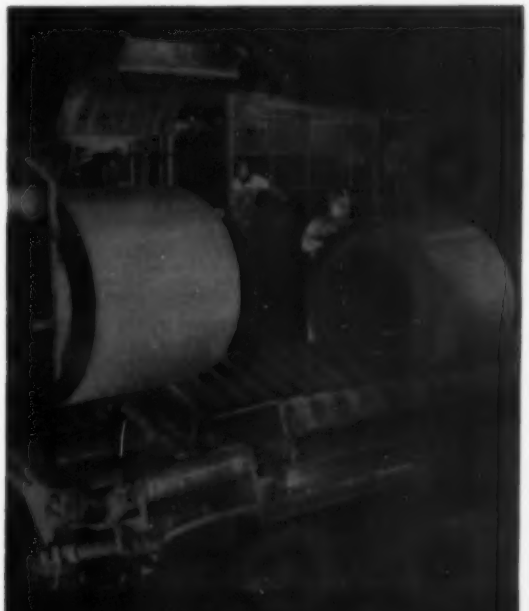
- Asked by a stockholder about plans for producing primary aluminum, Charles R. Cox, president, Kennecott Copper Corp., replied: "We are actively interested in exploring for bauxite, but no decision has been reached as to primary aluminum production, although such a possibility cannot be ruled out."
- Combined shipments of brass and bronze ingots in April totaled 25,808 tons, compared with 28,310 tons in March, reports the Defense Council of the Ingot Brass & Bronze Industry.
- Lead and zinc sales continue in the doldrums. Some observers are beginning to feel that there may be only slight improvements before August if car sales do not show substantial gains.
- There are indications that the ODM and the Interior department may agree that ODM (through GSA) should continue its tungsten purchase program for one more year. Reason: It would be a stopgap measure while Congress fights out new policies on long-range minerals requirements.

Newport Steel

HELPS MAKE THE WEATHER







As a supplier of integral steel products to manufacturers of heating, ventilating and air conditioning equipment, Newport Steel contributes widely to today's increased comfort and efficiency in office, factory, store and home. Many other prominent industries also find in Newport a most effective combination of precision control, flexibility of operation, and central location for economical, dependable delivery. The recent installation of modern new facilities is another step toward the complete integration of this 70-year-old mill, and provides consistent reliable service on all the products listed here.

ECONOMICAL WATERAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads, 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding,
Eave Trough and Conductor Pipe
Culverts

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 25.90; pigs, 24.00. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 27.70; No. 43, 5% Si, 27.50; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 29.70; No. 195, 4.5% Cu, 0.8% Si, 29.30; No. 214, 3.8% Mg, 29.30; No. 356, 7% Si, 0.3% Mg, 27.70.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 46.00 deld. Conn. Valley; 46.00 deld. Midwest; custom smelter, 43.00 deld.; Lake, 46.00 deld.; Fire refined, 45.75 deld.; Chilean electrolytic, 42.03 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 99 +, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis. 100 lb lots.

Magnesium: Pig, 33.75 f.o.b. Velasco, Tex.; ingot, 34.50 f.o.b. Velasco, Tex.

Magnesium Alloys: AZ91B (diecasting), 35.00 deld.; AZ63A, AZ92A, AZ91C (sand casting), 39.25 f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $265-$268 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced, $3.20 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $50-$100 per troy oz nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$110 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 90.75 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot 97.75; prompt, 97.50.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max), $3.25; grade A-2 (0.5% Fe max), $2.95 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom, f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld.

Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.00 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-26.75; No. 12 foundry alloy (No. 2 grade), 24.75-25.25; 5% silicon alloy, 0.60 Cu max, 26.25-26.50; 13 alloy, 0.60 Cu max, 26.25-26.50; 195 alloy, 26.75-27.00; 108 alloy, 25.00-25.25. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.00-27.00; grade 2, 24.25-26.25; grade 3, 23.50-25.50; grade 4, 23.00-24.50.

Brass Ingot: Red brass, No. 115, 40.50; tin bronze, No. 225, 53.50; No. 245, 46.75; high-leaded tin bronze, No. 305, 43.75; No. 1 yellow, No. 405, 31.75; manganese bronze, No. 421, 36.25.

Magnesium Alloy Ingot: AZ63A, 36.00; AZ91B, 36.00; AZ91C, 36.00; AZ92A, 36.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.92; rod, bar, wire, $1.89.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 51.35¢; l.c.l., 51.98. Weatherproof, 30,000-lb lots, 48.28; l.c.l., 49.03. Magnet wire deld., 15,000 lb or more, 58.68; l.c.l., 59.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $12.60-$13.10; sheared mill plate, $10.00-$12.00; strip, $12.10-$12.60; wire, $9.00-$11.50; forging billets, $7.25-$7.50; hot-rolled and forged bars, $7.55-$7.80.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $23; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	96
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	133

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam.(in.)or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	59.4	67.9	...	...
0.156-0.172	59.0	57.4	...	...
0.188	59.0	57.4	...	73.2
0.219-0.234	56.0	54.4	...	...
0.250-0.281	56.0	54.4	...	69.9
0.313	56.0	54.4	...	66.7
Cold-finished				
0.375-0.547	54.9	52.9	45.2	62.8
0.563-0.688	54.9	52.9	62.1	59.0
0.750-1.000	53.8	51.6	56.9	55.7
1.063	53.8	51.6	...	53.8
1.125-1.500	51.6	49.7	55.1	53.8
Rolled				
1.563	50.3	48.4	...	...
1.625-2.000	49.7	47.7	...	52.0
2.125-2.500	48.5	46.8	...	...
2.563-3.375	47.1	45.1	...	...

ALUMINUM

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	39.0	43.8	...	...
0.135-0.096	39.5	44.7	37.5	42.4
0.095-0.077	40.2	45.7	37.6	42.8
0.076-0.061	40.8	46.6	37.8	43.0
0.060-0.048	41.4	47.1	38.2	43.5
0.047-0.038	41.9	48.0	38.7	43.9
0.037-0.030	42.3	48.5	39.1	44.6
0.029-0.024	42.9	49.0	39.4	45.1
0.023-0.019	43.7	50.5	40.3	46.0
0.018-0.017	44.5	...	40.9	46.9
0.016-0.015	45.4	...	41.7	48.1
0.014	46.4	...	42.7	49.4
0.013-0.012	47.6	...	43.4	50.4
0.011	48.6	...	44.6	52.0
0.010-0.0095	49.9	...	45.8	53.7
0.009-0.0085	51.2	...	47.3	55.8
0.008-0.0075	52.8	...	48.5	57.6
0.007	54.3	...	50.0	59.9
0.006	55.9	...	51.4	64.9

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	38.0	42.3
5050-F	39.1	43.4
3004-F	40.1	45.3
5052-F	41.4	46.7
6061-T6	42.6	47.5
2024-T4*	45.1	51.4
7075-T6*	52.9	60.0

*24-48 in. widths or diam, 72-180 lengths.

ALUMINUM

Forging Stock: Round, Class 1, 40.60-51.60 in specific lengths 36-144 in. diameters 0.375-8 in. Rectangles and squares, Class 1, 44.50-57.70 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, 20-ft length, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size(in.)		Nom. Pipe Size(in.)	
⅜	$17.45	2	$ 53.85
1	27.35	4	148.60
1¼	37.05	6	266.55
1½	44.30	8	401.10

MAGNESIUM

Sheet and Plate: AZ31A standard grade, .032 in., 100.00; .081 in., 75.00; .188 in., 66.50; .250-2.0 in., 65.60. AZ31A special grade, .032 in., 103.10; .081 in., 103.50; .188 in., 91.10; .250-2.0, 88.90. Tread plate, .188 in., 88.90; .250-2.0 in., 87.80. Tooling plate, .250-3.0 in., 70.20.

Extruded Solid Shapes:

Factor	Com. Grade (FE)	Spec. Grade (AZ31B)
6-8	66.40-69.00	81.40-84.00
12-14	67.50-69.60	82.50-84.60
24-26	72.10-72.70	87.10-87.70
36-38	84.90-85.80	99.90-100.80

NONFERROUS SCRAP

DEALERS BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 16.00-16.50; old sheets, 12.00-12.50; borings and turnings, 7.00-7.50; crankcases, 12.00-12.50; industrial castings, 12.00-12.50.

Copper and Brass: No. 1 heavy copper and wire, 34.50-35.00; No. 2 heavy copper and wire, 32.00-32.50; light copper, 29.00-29.50; No. 1 composition red brass, 27.50-28.00; No. 1 composition turnings, 26.50-27.00; yellow brass

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES f		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	67.13b	64.36c	....	67.32	42.000	42.000	41.250
Yellow Brass	55.60	45.65d	56.14	58.51	31.250	31.000	29.000
Low Brass, 80%	60.15	60.09	60.69	62.96	35.375	35.125	34.625
Red Brass, 85%	61.79	61.73	62.33	64.66	37.000	36.750	36.250
Com. Bronze, 90%	63.98	63.92	64.52	66.54	38.500	38.250	37.750
Manganese Bronze	62.65	56.74	67.00	....	28.875	28.625	28.125
Muntz Metal	56.94	52.75	....	....	29.125	28.875	28.375
Naval Brass	58.84	53.15	55.90	62.06	28.875	28.625	28.125
Silicon Bronze	70.48	69.67	70.52	75.59e	40.750	40.500	39.750
Nickel Silver, 10%	70.16	72.49g	72.49	....	35.625	35.375	17.813
Phos. Bronze, A, 5%	84.92	85.42	85.42	86.60	42.125	41.875	40.875

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

turnings, 15.00-15.50; new brass clippings, 23.50-24.00; light brass, 16.50; heavy yellow brass, 19.00; new brass rod ends, 22.50-23.00; auto radiators, unsweated, 19.00-19.50; cocks and faucets, 21.00; brass pipe, 21.50.

Lead: Heavy, 12.50-12.75; battery plates, 6.50-6.75; linotype and stereotype, 14.00-14.50; electrotype, 13.25-13.75; mixed babbitt, 15.50.

Monel: Clippings, 65.00-90.00; old sheets, 65.00-80.00; turnings 65.00-70.00; rods, 65.00-99.00.

Nickel: Sheets and clips, 100.00-200.00; rolled anodes, 100.00-200.00; turnings, 85.00-185.00; rod ends, 100.00-200.00.

Zinc: Old zinc, 5.50-6.00; new die-cast scrap, 5.50; old die-cast scrap, 3.00.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 17.50-18.75; 3003 clippings, 17.50-18.50; 6151 clippings, 17.50-18.50; 5052 clippings, 17.50-18.50; 2014 clippings, 17.00-18.50; 2017 clippings, 17.00-18.50; 2024 clippings, 17.00-18.50; mixed clippings, 17.00-18.00; old sheet, 15.50-16.50; old cast, 15.50-16.50; clean old cable (free of steel), 15.50-18.25; borings and turnings, 16.00-17.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 68.00; light scrap, 83.00; turnings and borings, 48.00.

Copper and Brass: No. 1 heavy copper and wire, 35.50; No. 2 heavy copper and wire, 34.00; light copper, 31.75; refinery brass (60% copper) per dry copper content, 33.50.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 35.50; No. 2 heavy copper and wire, 34.00; light copper, 31.75; No. 1 composition borings, 29.00; No. 1 composition solids, 29.50; heavy yellow brass solids, 20.50; yellow brass turnings, 19.50; radiators, 22.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 63.79; oval, 62.92, 5000-10,000 lb; electrodeposited, 57.78, 2000-5000 lb lots; cast 58.04-59.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery, effective Jan. 1, 1955.

Tin: Bar or slab, less than 200 lb, $1.155; 200-499 lb, $1.140; 500-999 lb, $1.135; 1000 lb or more, $1.130.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 83.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.35. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 15-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb, and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 69.90; 100-499 lb, 61.60; 700-1900 lb, 59.10; 2000-9900 lb, 57.40; 10,000 lb or more, 56.20.

Stannous Chloride (anhydrous): Less than 25 lb, $1.665; 25 lb, $1.315; 100 lb, $1.165; 400 lb, $1.141; 5200-19,600 lb, $1.019; 20,000 lb or more, 89.70.

Stannous Sulphate: Less than 50 lb, $1.293; 50 lb, 99.30; 100-1900 lb, 97.30; 2000 lb or more, 95.30.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

dial ATLAS for corrosion control

Help in solving your corrosion problem is as near as your phone . . . and the number is listed below. Atlas, with a quarter century of experience in solving corrosion problems, helps over 3,000 plants each year to reduce lost time and money caused by corrosion. Atlas is familiar with all types of corrosion problems, from coating small items of plant equipment to the construction of the largest continuous picklers.

Our facilities are geared to help you with on-the-spot technical advice, engineering and design assistance, highest quality corrosion proof materials and construction services to carry the job from beginning to end.

A phone call will bring an Atlas technical representative . . . a letter will bring literature on the complete line of corrosion proof cements, protective coatings, tank linings, rigid plastic fabrications and rigid plastic piping.

Phone or write:

NEW YORK, N. Y. — 475 5th Ave. MU 3-1868
NIAGARA FALLS, N. Y.—1417 Ferry Ave. 4-5149
PHILADELPHIA, PA. — 1436-37 Land Title Bldg. RI 6-0298
PITTSBURGH, PA. — 4518 Brownsville Rd. TUxedo 1-4720
CINCINNATI, OHIO—1814 Yorktown Rd. EL 1-4884
DETROIT, MICH.—2604 Oliver St., Royal Oak. LI 6-4870
CHICAGO, ILL. — 333 N. Michigan Ave. FR 2-7100
BIRMINGHAM, ALA.—304-06 Brown Marx Bldg. 4-2581
MEMPHIS, TENN. — 4711 Poplar Ave. MUtual 5-5001
KANSAS CITY, MO. — 1412 W. 47th St. VA 7507
TULSA, OKLA. — 1515 W. Archer St. Gibson 7-7002
FORT WORTH, TEXAS — 7001 Glen Hills Rd. VA 2621
HOUSTON, TEXAS — 324 Hathaway St. JAckson 6-1249
EL PASO, TEXAS—609 Laurel St. 3-7575
SALT LAKE CITY, UTAH — P.O. Box 19 HUnter 4-1662
KIRKLAND, WASH. — Route 4, Box 707 VA 6456
BERKELEY, CAL. — 605 Addison St. TH 3-6826
LOS ANGELES, CAL.—Hollingsworth Bldg. VA 1444

MERTZTOWN, PA.—Phone: Topton 37

ATLAS MINERAL
MERTZTOWN, PENNSYLVANIA

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 181; to footnotes, page 183.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 ..... $65.50

INGOTS, Alloy (NT)

Detroit R7 ..... $80.00
Houston 85 ..... 74.00
Midland,Pa. C18 ..... 69.00
Munhall,Pa. U5 ..... 69.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 ..... $58.50
Bessemer,Pa. U5 ..... 58.50
Bridgeport,Conn. N19 .. 73.50
Buffalo R3 ..... 58.50
Clairton,Pa. U5 ..... 58.50
Ensley,Ala. T2 ..... 58.50
Fairfield,Ala. T2 ..... 58.50
Fontana,Calif. K1 .... 78.00
Gary,Ind. U5 ..... 58.50
Johnstown,Pa. B2 ..... 58.50
Lackawanna,N.Y. B2 .. 58.50
LoneStar,Tex. L6 .... 74.50
Munhall,Pa. U5 ..... 58.50
Pittsburgh J5 ..... 58.50
S.Chicago,Ill. R2, U5 .. 58.50
S.Duquesne,Pa. U5 .... 58.50
Youngstown R2 ..... 58.50

Carbon, Forging (NT)

Aliquippa,Pa. J5 .... $84.50
Bessemer,Pa. U5 ..... 84.50
Bridgeport,Conn. N19 .. 89.50
Buffalo R2 ..... 84.50
Canton,O. R2 ..... 86.50
Clairton,Pa. U5 ..... 84.50
Conshohocken,Pa. A3 .. 89.50
Ensley,Ala. T2 ..... 84.50
Fairfield,Ala. T2 .... 84.50
Fontana,Calif. K1 .... 94.00
Gary,Ind. U5 ..... 84.50
Geneva,Utah C11 ..... 84.50
Houston 85 ..... 101.00
Johnstown,Pa. B2 .... 84.50
Lackawanna,N.Y. B2 .. 84.50
LosAngeles B3 ..... 94.00
Midland,Pa. C18 ..... 84.50
Munhall,Pa. U5 ..... 84.50
Pittsburgh J5 ..... 84.50
Seattle B3 ..... 98.00
S.Chicago R2,U5,W14 .. 84.50
S.Duquesne,Pa. U5 .... 84.50
S.SanFrancisco B3 .... 94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 .... $96.00
Buffalo R2 ..... 96.00
Canton,O. R2, T7 .... 96.00
Conshohocken,Pa. A3 .. 103.00
Detroit R7 ..... 96.00
Fontana,Calif. K1 .... 117.00
Gary,Ind. U5 ..... 96.00
Houston 85 ..... 105.00
Ind.Harbor,Ind. Y1 .. 96.00
Johnstown,Pa. B2 .... 96.00
Lackawanna,N.Y. B2 .. 96.00
LosAngeles B3 ..... 116.00
Massillon,O. R2 ..... 96.00
Midland,Pa. C18 ..... 96.00
Munhall,Pa. U5 ..... 96.00
S.Chicago R2,U5,W14 .. 96.00
S.Duquesne,Pa. U5 .... 96.00
Struthers,O. Y1 ..... 96.00
Warren,O. C17 ..... 96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 ..... $163.50
Canton,O. R2 ..... 163.50
Cleveland R2 ..... 163.50
Gary,Ind. U5 ..... 163.50
S.Chicago R2, W14 .... 163.50
S.Duquesne,Pa. U5 .. 163.50

SKELP

Aliquippa,Pa. J5 ..... 4.325
LoneStar,Tex. L6 ..... 4.625
Munhall,Pa. U5 ..... 4.225
SparrowsPoint,Md. B2 .. 4.225
Warren,O. R2 ..... 4.225
Youngstown R2, U5 ... 4.225

WIRE RODS

AlabamaCity,Ala. R3 .. 5.375
Aliquippa,Pa. J5 ..... 5.375
Alton,Ill. L1 ..... 5.55
Buffalo W12 ..... 5.375
Cleveland A7 ..... 5.375
Donora,Pa. A7 ..... 5.375
Fairfield,Ala. T2 ..... 5.375
Houston 85 ..... 5.625
Indiana Harbor,Ind. Y1 . 5.375
Johnstown,Pa. B2 .... 5.375
Joliet,Ill. A7 ..... 5.375
KansasCity,Mo. S6 .... 5.625
Kokomo,Ind. C14 ..... 5.475
Los Angeles B3 ..... 6.175
Minnequa,Colo. C10 ... 5.625
Monessen,Pa. P7 ..... 5.375
N.Tonawanda,N.Y. B11 5.375
Pittsburg Calif. C11 ... 6.025
Portsmouth,O. P12 .... 5.375
Roebling,N.J. R5 ..... 5.475
S.Chicago,Ill. R2 ..... 5.375
SparrowsPoint,Md. B2.. 5.475
Sterling,Ill.(1) N15 .... 5.375
Sterling,Ill. N15 ..... 5.475
Struthers,O. Y1 ..... 5.375
Worcester,Mass. A7 ... 5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 ..... 4.50
Aliquippa,Pa. J5 ..... 4.50
Bessemer,Ala. T2 ..... 4.60
Bethlehem,Pa. B2 ..... 4.65
Birmingham C15 ..... 5.10
Clairton,Pa. U5 ..... 4.60
Fairfield,Ala. T2 ..... 4.60
Fontana,Calif. K1 ..... 5.30
Gary,Ind. U5 ..... 4.60
Geneva,Utah C11 ..... 4.60
Houston 85 ..... 4.70
Ind.Harbor,Ind. I-2 .... 4.60
Johnstown,Pa. B2 .... 4.65
KansasCity,Mo. S5 .... 4.78
Lackawanna,N.Y. B2 .. 4.65
LosAngeles B3 ..... 5.30
Minnequa,Colo. C10 .... 4.90
Munhall,Pa. U5 ..... 4.60
Niles,Calif. P1 ..... 5.25
Phoenixville,Pa. P4 .... 5.15
Portland,Oreg. O4 .... 5.35
Seattle B3 ..... 5.35
S.Chicago U5, W14 .... 4.60
S.SanFrancisco B3 .... 5.25
Torrance,Calif. C11 .... 5.30
Weirton,W.Va. W6 ..... 4.60

Wide Flange

Bethlehem,Pa. B2 ..... 4.65
Clairton,Pa. U5 ..... 4.60
Fontana,Calif. K1 ..... 5.45
Lackawanna,N.Y. B2 .. 4.65
Munhall,Pa. U5 ..... 4.60
Phoenixville,Pa. P4 .... 5.15
S.Chicago,Ill. U5 ..... 4.60

Alloy Std. Shapes

Clairton,Pa. U5 ..... 5.65
Fontana,Calif. K1 .... 7.40
Gary,Ind. U5 ..... 5.65
Houston 85 ..... 5.75
Munhall,Pa. U5 ..... 5.65
S.Chicago,Ill. U5 ..... 5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 ..... 6.75
Bessemer,Ala. T2 ..... 6.75
Bethlehem,Pa. B2 ..... 6.80
Clairton,Pa. U5 ..... 6.75
Fairfield,Ala. T2 ..... 6.75
Fontana,Calif. K1 .... 7.45
Gary,Ind. U5 ..... 6.75
Geneva,Utah C11 ..... 6.75
Houston 85 ..... 6.85
Ind.Harbor,Ind. I-2, Y1. 6.75
Johnstown,Pa. B2 .... 6.80
KansasCity,Mo. S5 .... 6.85
Lackawanna,N.Y. B2 .. 6.80
LosAngeles B3 ..... 7.45
Munhall,Pa. U5 ..... 6.75
Seattle B3 ..... 7.50
S.Chicago,Ill. U5, W14.. 6.75
S.SanFrancisco B3 .... 7.40
Struthers,O. Y1 ..... 6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 ..... 6.80
Lackawanna,N.Y. B2 .. 6.80
Munhall,Pa. U5 ..... 6.75
S.Chicago,Ill. U5 ..... 6.75

PILING

BEARING PILES

Bethlehem,Pa. B2 ..... 4.65
Lackawanna,N.Y. B2 ... 4.65
Munhall,Pa. U5 ..... 4.60
S.Chicago,Ill. U5 ..... 4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 .... 5.45
Lackawanna,N.Y. M2 ... 5.45
Munhall,Pa. U5 ..... 5.45
S.Chicago,Ill. U5 ..... 5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 ..... 4.50
Aliquippa,Pa. J5 ..... 4.50
Ashland,Ky.(15) A10 .. 4.50
Bessemer,Ala. T2 ..... 4.50
Bridgeport,Conn. N19 .. 4.75
Buffalo R2 ..... 4.50
Clairton,Pa. U5 ..... 4.50
Claymont,Del. C22 ..... 5.35
Cleveland J5, R2 ..... 4.60
Coatesville,Pa. L7 ..... 4.80
Conshohocken,Pa. A3 ... 4.50
Detroit M1 ..... 4.60
Ecorse,Mich. G5 ..... 4.60
Fairfield,Ala. T2 ..... 4.50
Fontana,Calif.(30) K1 .. 5.20
Gary,Ind. U5 ..... 4.50
Geneva,Utah C11 ..... 4.50
GraniteCity,Ill. G4 ..... 4.70
Harrisburg,Pa. P4 ..... 5.10
Houston 85 ..... 4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 ..... 4.50
Lackawanna,N.Y. B2 .. 4.50
LoneStar,Tex. L6 ..... 4.85
Mansfield,O. E6 ..... 4.50
Minnequa,Colo. C10 .... 5.35
Munhall,Pa. U5 ..... 4.50
Newport,Ky. N9 ..... 4.50
Pittsburgh J5 ..... 4.50
Riverdale,Ill. A1 ..... 4.725
Seattle B3 ..... 5.40
Sharon,Pa. S3 ..... 4.50
S.Chicago R2, U5, W14.. 4.50
SparrowsPoint,Md. B2 .. 4.50
Steubenville,O. W10 .... 4.50
Warren,O. R2 ..... 4.50
Weirton,W.Va. W6 ..... 4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 ..... 6.20
Fontana,Calif. K1 ..... 6.35
Geneva,Utah C11 ..... 5.65
Johnstown,Pa. B2 ..... 5.65
SparrowsPoint,Md. B2 .. 5.65

PLATES, Wrought Iron

Economy,Pa. B14 ..... 10.40

PLATES, High Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.725
Bessemer,Ala. T2 ..... 6.725
Clairton,Pa. U5 ..... 6.725
Cleveland J5, R2 ..... 6.725
Claymont,Del. C22 .... 6.725
Coatesville,Pa. L7 .... 7.025
Conshohocken,Pa. A3 .. 6.725
Ecorse,Mich. G5 ..... 6.825
Fairfield,Ala. T2 ..... 6.725
Fontana,Calif.(30) K1.. 7.425
Gary,Ind. U5 ..... 6.725
Geneva,Utah C11 ..... 6.725
Houston 85 ..... 6.825
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .... 6.725
Munhall,Pa. U5 ..... 6.725
Pittsburgh J5 ..... 6.725
Seattle B3 ..... 7.625
Sharon,Pa. S3 ..... 6.725
S.Chicago,Ill. U5, W14.6.725
SparrowsPoint,Md. B2.. 6.725
Warren,O. R2 ..... 6.725
Youngstown U5, Y1 ... 6.725

PLATES, Alloy

Bridgeport,Conn. N19 ... 6.55
Claymont,Del. C22 .... 6.30
Coatesville,Pa. L7 .... 6.30
Fontana,Calif. K1 .... 7.00
Gary,Ind. U5 ..... 6.30
Houston 85 ..... 6.40
Ind.Harbor,Ind. Y1 .... 6.30
Johnstown,Pa. B2 .... 6.30
Munhall,Pa. U5 ..... 6.30
Newport,Ky. N9 ..... 6.30
Seattle B3 ..... 7.20
Sharon,Pa. S3 ..... 6.30
S.Chicago,Ill. U5, W14.. 6.30
SparrowsPoint,Md. B2 .. 6.30
Youngstown Y1 ..... 6.30

FLOOR PLATES

Cleveland J5 ..... 5.575
Conshohocken,Pa. A3 .. 5.575
Harrisburg,Pa. P4 .... 5.575
Ind.Harbor,Ind. I-2 .... 5.575
Munhall,Pa. U5 ..... 5.575
S.Chicago,Ill. U5 ..... 5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10... 4.75
Ashland,l.c.l. (15) A10.. 5.25
Cleveland c.l. R2 ..... 5.10
Warren,O. c.l. R2 ..... 5.10

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2 .... 4.65
Aliquippa,Pa.(9) J5 .... 4.65
Alton,Ill. L1 ..... 4.85
Atlanta(9) A11 ..... 5.15
Bessemer,Ala.(9) T2 .... 4.65
Birmingham C15 ..... 5.15
Bridgeport,Conn. N19 .. 4.80
Buffalo(9) R2 ..... 4.65
Canton,O.(9) R2 ..... 4.75
Clairton,Pa.(9) U5 .... 4.65
Cleveland(9) R2 ..... 4.65
Ecorse,Mich.(9) G5 .... 4.75
Emeryville,Calif. J7 .... 5.40
Fairfield,Ala.(9) T2 .... 4.65
Fairless,Pa.(9) U5 .... 4.80
Fontana,Calif. K1 .... 5.35
Gary,Ind.(9) U5 ..... 4.65
Houston(9) 85 ..... 4.90
Ind.Harbor,Ind.(9) I-2.. 4.65
Ind.Harbor,Ind. Y1 .... 4.65
Johnstown,Pa.(9) B2 .... 4.65
Joliet,Ill. P22 ..... 5.15
KansasCity,Mo.(9) S5 .. 4.90
Lackawanna(9) B2 .... 4.65
LosAngeles(9) B3 .... 5.35
Massillon,O.(9) R2 .... 4.75
Midland,Pa.(9) C18 .... 4.65
Milton,Pa. M18 ..... 4.80
Minnequa,Colo. C10 .... 5.10
Niles,Calif. P1 ..... 5.35
N.Tonawanda,N.Y.(9) B11 4.65
Pittsburg,Calif.(9) C11.. 5.35
Pittsburgh(9) J5 ..... 4.65
Portland,Oreg. O4 .... 5.40
Seattle B3 N14 ..... 5.40
S.Chicago W14 ..... 4.65
S.Chicago,Ill.(9) R2, U5 4.65
S.Duquesne,Pa.(9) U5 .. 4.65
S.SanFran.,Calif.(9) B3 5.40
Sterling,Ill.(1) N15 .... 4.65
Sterling,Ill. N15 ..... 4.75
Struthers,O Y1 ..... 4.65
Torrance,Calif.(9) C11.. 5.35
Warren,O.(9) R2 ..... 4.65
Weirton,W.Va.(9) W6 .. 4.65
Youngstown(9) R2, U5.. 4.65

BARS, H.R. Leaded Alloy

Warren,O. C17 ..... 6.575

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 ..... 5.575
Bridgeport,Conn. N19 .. 5.725
Buffalo R2 ..... 5.575
Canton,O. R2, T7 ..... 5.575
Clairton,Pa. U5 ..... 5.575
Detroit R7 ..... 5.575
Ecorse,Mich. G5 ..... 5.675
Fairless,Pa. U5 ..... 5.725
Fontana,Calif. K1 .... 6.625
Gary,Ind. U5 ..... 5.575
Houston 85 ..... 5.825
Ind.Harbor,Ind. I-2, Y1.5.575
Johnstown,Pa. B2 .... 5.575
KansasCity,Mo. S5 .... 5.825
Lackawanna,N.Y. B2 .. 5.575
LosAngeles B3 ..... 6.625
Massillon,O. R2 ..... 5.575
Midland,Pa. C18 ..... 5.575
S.Chicago R2, U5, W14 5.575
S.Duquesne,Pa. U5 .... 5.575
Struthers,O. Y1 ..... 5.575
Warren,O. C17 ..... 5.575
Youngstown U5 ..... 5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 ..... 6.80
Bessemer,Ala. T2 ..... 6.80
Bethlehem,Pa. B2 ..... 6.80
Clairton,Pa. U5 ..... 6.80
Cleveland R2 ..... 6.80
Ecorse,Mich. G5 ..... 6.90
Fairfield,Ala. T2 ..... 6.80
Fontana,Calif. K1 ..... 7.50
Gary,Ind. U5 ..... 6.80
Houston 85 ..... 7.05
Ind.Harb.,Ind. I-2, Y1.. 6.80
Johnstown,Pa. B2 ..... 6.80
KansasCity,Mo. S5 ..... 7.05
Lackawanna,N.Y. B2 .. 6.80
LosAngeles B3 ..... 7.50
Pittsburgh J5 ..... 6.80
Seattle B3 ..... 7.55
S.Chicago W14 ..... 6.80
S.Duquesne,Pa. U5 .... 6.80
S.SanFrancisco B3 .... 7.55
Struthers O. Y1 ..... 6.80
Warren,O. R2 ..... 6.80
Youngstown U5 ..... 6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2 .. 4.80
Lackawanna(9) B2 .... 4.65

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 ..... 4.65
Atlanta A11 ..... 5.15
Fontana,Calif. K1 .... 5.35
Joliet,Ill. P22 ..... 5.10
Niles Calif. P1 ..... 5.35
Pittsburgh J5 ..... 4.65
Portland,Oreg. O4 .... 5.40
SanFrancisco S7 ..... 5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 ..... 5.65
Gary,Ind. U5 ..... 5.65
Houston 85 ..... 5.90
KansasCity,Mo. S5 .... 5.90
Youngstown U5 ..... 5.65

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 .... 8.325
Camden,N.J. P13 ..... 8.35
Chicago W18 ..... 8.325
Cleveland C20 ..... 8.325
Monaca,Pa. S17 ..... 8.325
Newark,N.J. W18 ..... 8.50
SpringCity,Pa. K3 .... 8.30
Warren,O. C17 ..... 8.575

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 .... 6.25
BeaverFalls,Pa. M12,R2 6.25
Buffalo B5 ..... 6.30
Camden,N.J. P13 ..... 6.70
Carnegie,Pa. C12 ..... 6.25
Chicago W18 ..... 6.25
Cleveland A7, C20 .... 6.25
Detroit B5, F17 ..... 6.45
Detroit R7 ..... 6.25
Donora,Pa. A7 ..... 6.25
Elyria,O. W8 ..... 6.25
FranklinPark,Ill. N5 ... 6.25
Gary,Ind. R2 ..... 6.25
GreenBay,Wis. F7 ..... 6.25
Hammond,Ind. L2, M13.6.25
Hartford,Conn. R2 .... 6.75
Harvey,Ill. B5 ..... 6.25
LosAngeles(49) S30 .... 7.70
LosAngeles R2 ..... 7.70
Manafield,Mass. B5 .... 6.80
Massillon,O. R2 R8 .... 6.25
Midland,Pa. C18 ..... 6.25
Monaca,Pa. S17 ..... 6.25
Newark,N.J. W18 ..... 6.70
NewCastle,Pa.(17) B4 .. 6.25
Pittsburgh J5 ..... 6.25
Plymouth,Mich. P5 .... 6.50
Putnam,Conn. W18 .... 6.80
Readville,Mass. C14 .... 6.80
S.Chicago,Ill. W14 ..... 6.25
SpringCity,Pa. W3 ..... 6.70
Struthers,O. Y1 ..... 6.25
Waukegan,Ill. A7 ..... 6.25
Worcester,Mass. W19 ... 6.70
Youngstown F3, Y1 .... 6.25

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19.. 5.16

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 .... 7.425
BeaverFalls,Pa. M12,R2 7.425
Bethlehem,Pa. B2 ..... 7.425
Buffalo B5 ..... 7.425
Camden,N.J. P13 ..... 7.60
Canton,O. T7 ..... 7.425
Carnegie,Pa. C12 ..... 7.425
Chicago W18 ..... 7.425
Cleveland A7, C20 .... 7.425
Detroit R7 ..... 7.425
Detroit B5, F17 ..... 7.625
Donora,Pa. A7 ..... 7.425
Elyria,O. W8 ..... 7.425
Gary,Ind. R2 ..... 7.425
GreenBay,Wis. F7 ..... 7.425
Hammond,Ind. L2, M13.7.425
Hartford,Conn. R2 .... 7.725
Harvey,Ill. B5 ..... 7.425
Lackawanna,N.Y. B2 .. 7.425
LosAngeles S30 ..... 9.10
Mansfield,Mass. B5.... 7.725
Massillon,O. R2, R8 ... 7.425
Midland,Pa. C18 ..... 7.425
Monaca,Pa. S17 ..... 7.425
Newark,N.J. W18 ..... 7.60
Plymouth,Mich. P5 .... 7.625
S.Chicago W14 ..... 7.425
SpringCity,Pa. K3 ..... 7.60
Struthers,O. Y1 ..... 7.425
Warren,O. C17 ..... 7.425
Waukegan,Ill. A7 ..... 7.425
Worcester,Mass. A7 ... 7.725
Youngstown F3, Y1 .... 7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 ..... 4.65
Atlanta A11 ..... 5.15
Birmingham C15 ..... 5.15
Buffalo R2 ..... 4.65
Cleveland R2 ..... 4.65
Ecorse,Mich. G5 ..... 4.75
Emeryville,Calif. J7 .... 5.40
Fairfield,Ala. T2 ..... 4.65
Fairless,Pa. U5 ..... 4.80
Fontana,Calif. K1 .... 5.35
Ft.Worth,Tex.(42) T4 .. 5.10
Gary,Ind. U5 ..... 4.65
Houston 85 ..... 4.90

Ind.Harbor,Ind. I-2, Y1..4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....5.15
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.35
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5 ....4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2..6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ..6.17
Marion,O. P11 .....6.15
Pittsburgh U5 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ⅛-1" B2 ..6.15
Williamsport,Pa. S19 ...6.00

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2..4.65
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex.(26) T4 ..5.10
Franklin,Pa. (3) F5 ....4.65
Franklin,Pa.(4) F5 ....4.65
JerseyShore,Pa.(4) J8 ..4.65
Marion,O.(3) P11 .....4.65
Moline,Ill.(3) R2 .....4.80
Tonawanda(3) B12 ....5.15
Tonawanda(4) B12 ....5.15
Williamsport,Pa.(3) S19.4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14. 14.65
McK.Rks.(S.R.) L5 ...11.50
Mck.Rks.(D.R.) L5 ...16.00
Mck.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ..4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
Fairless,Pa. U5 .....4.375
Fontana,Calif. K1 ....5.125
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2,Y1.4.325
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6 (37) ..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ...4.325
Niles,O. M21 .....4.325
Pittsburg,Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.55
Sharon,Pa. S3 .....4.325
S.Chicago Ill. W14 ....4.325
SparrowsPoint,Md. B2.4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ...4.325

SHEETS, H.R., (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Niles,O. M21 .....5.125

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.20
Gary,Ind. U5 .....7.20
Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1, U5 ....7.20

SHEETS, H.R. (14 Ga. & Heavier) High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken,Pa. A3 ...6.425
Dravosburg,Pa. U5 ...6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
Fairless,Pa. U5 .....6.425
Fontana,Calif. K1 ....7.175
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1.6.375
Lackawanna(35) B2 ...6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2..6.375
Warren,O. R2 .....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Ind.Harbor,Ind. I-2 ...4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
Fairless,Pa. U5 .....5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....6.525
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.525
Ind.Harbor,Ind. I-2, Y1.5.325
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport,Ky. N9 .....5.325
Pittsburg,Calif. C11 ...6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled High-Strength Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.975
Fairless,Pa. U5 .....7.925
Fontana,Calif. K1 ....9.075
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.825

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.90	...
Canton,O. R2	6.10	6.55
Dravosburg U5	6.10	...
Fairfield T2	6.10	...
Gary,Ind. U5	6.10	6.35
Ind.Harbor I-2	6.10	6.35
Kokomo,Ind. C16	6.20	...
MartinsFry. W10	6.10	...
Newport,Ky. N9	6.10	6.35
Pitts.,Calif. C11	6.85	...
SparrowsPt. B2	6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry,O. W10 ....6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.85‡
Ashland,Ky. A10 .....5.85‡
Canton,O. R2 .....5.85‡
Dover,O. R1 .....5.85†
Dravosburg,Pa. U5 ....5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind U5 .....5.85*
GraniteCity,Ill. G4 ....6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Pittsburg,Calif. C11 ...6.60*
Pittsburgh J5 .....5.85†
SparrowsPt.,Md. B2 ...5.85†
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ...5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.625

SHEETS, Galvanized High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.35
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25

SHEETS, Galvanized Ingot Iron (Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Middletown,O. A10 .....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. M21 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. M21 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....6.65

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine& Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod., Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N19 Northeastern Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Noreastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P23 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T6 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.125
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2,Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	5.075
Riverdale,Ill. A1	4.55
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.95
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.575
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2,Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y-1	6.25
Indianapolis C6	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.30
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7, D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(33) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	6.80
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20
Ind.Harbor,Ind. Y1	9.30

STRIP, Cold-Finished Spring Steel (Annealed)	0.36-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.90	13.05	15.75
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	....	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.90	13.05	15.75
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle,Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
NewYork W3	...	9.25	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y.(32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.25	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.80	18.15	....
Buffalo W12	...	...	14.80	....	....
FranklinPark,Ill. T6	...	...	15.15	18.50	22.35
Harrison,N.J. C18	...	...	14.80	18.15	22.00
NewYork W3	...	...	14.80	18.15	22.00
Trenton,N.J. R5	...	...	14.80	18.15	22.00
Worcester,Mass. W12	...	...	14.80	....	....
Worcester,Mass. A7, T6	...	...	14.80	18.15	22.00
Youngstown C8	...	...	15.15	18.50	22.35

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

STRIP, Electrogalvanized	
Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.35*
Warren,O. B9, T5	6.25*
Worcester,Mass. A7	6.80*
Youngstown C8	6.25*

*Plus galvanizing extras.

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. M21	8.40	9.35	9.95	10.95	....
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	8.80*	10.40*	11.40	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Vandergrift,Pa. U5	....	10.10†	10.70†	11.70†	12.60†
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	17.45	17.95	....	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	....	13.55
Warren,O. R2	....	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.30	$8.55	$8.95
Dravosburg,Pa. U5	8.30	8.55	8.95
Fairfield,Ala. T2	8.40	8.65	9.05
Fontana,Calif. K1	9.05	9.30	9.70
Fairless,Pa. U5	8.40	8.65	9.05
Gary,Ind. U5	8.30	8.55	8.95
GraniteCity,Ill. G4	8.40	8.65	9.05
IndianaHarbor,Ind. I-2, Y-1	8.30	8.55	8.95
Niles,O. R2	8.30	8.55	8.95
Pittsburg,Calif. C11	9.05	9.30	9.70
SparrowsPoint,Md. B2	8.40	8.65	9.05
Weirton,W.Va. W6	8.30	8.55	8.95
Yorkville,O. W10	8.30	8.55	8.95
ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.975	....	....
Niles,O. R2	6.975	7.175	7.375

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.60	$9.85
Dravosburg,Pa. U5	9.60	9.85
Fairfield,Ala. T2	9.70	9.95
Fairless,Pa. U5	9.70	9.95
Fontana,Calif. K1	10.35	10.60
Gary,Ind. U5	9.60	9.85
Ind.Har. I-2, Y1	9.60	9.85
Pitts.,Calif. C11	10.35	10.60
Sp.Pt.,Md. B2	9.70	9.95
Weirton,W.Va. W6	9.60	9.85
Yorkville,O. W10	9.60	9.85

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.40
Dravosburg,Pa. U5	7.40
Fairfield,Ala. T2	7.50
Fairless,Pa. U5	7.50
Fontana,Calif. K1	8.15
Gary,Ind. U5	7.40
GraniteCity,Ill. G4	7.50
Ind.Harbor,Ind. I-2, Y1	7.40
Niles,O. R2	7.40
Pittsburg,Calif. C11	8.15
SparrowsPoint,Md. B2	7.50
Warren,O. R2	7.40
Weirton,W.Va. W6	7.40
Yorkville,O. W10	7.40

HOLLOWARE ENAMELING Black Plate (29 Gage)

DravosburgPa. U5	7.05
Gary,Ind. U5	7.05
GraniteCity,Ill. G4	6.75
Ind.Harbor,Ind. Y1	7.05
Yorkville,O. W10	7.05

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$9.10
Gary,Ind. U5	9.10
Yorkville,O. W10	9.10

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$9.55

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.65

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.60
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.80
Bartonville,Ill. K4	6.70
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7	6.60
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	6.60
Duluth,Minn. A7	6.60
Fairfield,Ala. T2	6.60
Fostoria,O. (24) S1	6.80
Houston S5	6.85
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	6.60
Joliet,Ill. A7	6.60
KansasCity,Mo. S5	6.85
Kokomo,Ind. C16	6.70
LosAngeles B3	7.55
Minnequa,Colo. C10	6.85
Monessen,Pa. P7	6.60
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.60
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	7.55
Portsmouth,O. P12	6.60
Rankin,Pa. A7	6.60
S.Chicago,Ill. R2	6.60
S.SanFrancisco C10	7.55
SparrowsPoint,Md. B2	6.70
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.60
Waukegan,Ill. A7	6.60
Worcester,Mass. A7	6.90

WIRE, MS Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P16	7.60
NewHaven,Conn. A7	7.90
PalmerMass. W12	7.90
Pittsburg,Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	12.90
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P6	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Palmer,Mass. W12	11.00
Pittsburg,Calif. C11	11.80
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80
Struthers,O. Y1	10.70

ROPE WIRE	(A)
Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P12	10.55
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.50
Baltimore T6	9.80
Boston T6	9.80
Buffalo W12	9.50
Cleveland A7	9.50
Crawfordsville,Ind. M8	*9.50*
Dover,O. G6	9.50
Fostoria,O. S1	9.50
FranklinPark,Ill. T6	9.60
Kokomo,Ind. C16	9.50
Massillon,O. R8	9.50
Milwaukee C23	9.70
Monessen,Pa. P16	9.50
Pawtucket,R.I. N8	9.80
Riverdale,Ill. A1	9.60
Rome,N.Y. R6	9.50
Trenton,N.J. R5	9.80
Worcester A7, T6, W12	9.80

NAIL, Stock
To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(20) M8	*163*
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)
To Dealers (33)

Conshohocken,Pa. A3	$9.65
Wheeling,W.Va. W10	9.00

STAPLES, Polished Stock
To Dealers & Mfrs. (7) Col.

AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla.(20) M8	*163*
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill. (1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$9.45
Bartonville,Ill. K4	9.45
Buffalo W12	9.45
Crawfordsville,Ind. M8	*9.55*
Donora,Pa. A7	9.45
Duluth,Minn. A7	9.45
Jacksonville,Fla. M8	*10.01*
Johnstown,Pa. B2	9.45
Joliet,Ill. A7	9.45
Kokomo,Ind. C16	9.45
LosAngeles B3	10.24
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.23
S.Chicago,Ill. R2	9.45
SparrowsPt., Md. B2	9.55
Sterling,Ill. N15	9.35

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Crawfordsville,Ind. M8	*9.85*
Donora,Pa. A7	9.75
Duluth,Minn. A7	9.75
Jacksonville,Fla. M8	*10.31*
Johnstown,Pa. B3	9.75
Joliet,Ill. A7	9.75
Kokomo,Ind. C16	9.75
LosAngeles B3	10.65
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.55
S.Chicago,Ill. R2	9.75
SparrowsPt.,Md. B2	9.85
Sterling,Ill. N15	9.65

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$9.80
Bartonville,Ill. K4	9.80
Buffalo W12	9.80
Crawfordsville,Ind. M8	*9.90*
Donora,Pa. A7	9.80
Duluth,Minn. A7	9.80
Jacksonville,Fla. M8	*10.36*
Johnstown,Pa. B2	9.80
Joliet,Ill. A7	9.80
Kokomo,Ind. C16	9.80
LosAngeles B3	10.60
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.80
SparrowsPt.,Md. B2	9.90
Sterling,Ill. N15	9.70

WIRE, Barbed — **Col.**

AlabamaCity,Ala. R2	175**
Aliquippa,Pa. J5	172‖
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180**
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180**
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179††

WOVEN FENCE, 9-15 ga. — **Col.**

Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	257**
Aliq'ppa,Pa.9-14½ga J5	165‖
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167**
Jacksonville,Fla. M8	173
Johnstown,Pa. (43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167**
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P17	166††
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166††

WIRE (16 Gage)	An'id Galv. Stone	Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.50	16.55
Buffalo W12	14.50	
Cleveland A7	14.50	
Crawf'dsville M8	14.60	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.85	16.80
Johnstown B2	14.50	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05
Worcester A9	14.80	

WIRE, Merchant Quality
16 to 8 gage) An'id Galv.

Ala.City,Ala. R2	7.50 7.90**
Aliquippa J5	7.40 7.925‖
Atlanta A11	7.60 8.20
Bartonville(48) K4	7.60 8.20
Buffalo W12	7.50 7.90†
Cleveland A7	7.50
Crawfordsville M8	*7.60 8.20*
Donora,Pa. A7	7.50 7.90†
Duluth,Minn. A7	7.50 7.90†
Fairfield T2	7.50 7.90†
Houston(48) S5	7.65 8.05**
Jack'ville,Fla. M8	*7.85 8.45*
Johnstown B2(48)	7.50 8.10*
Joliet,Ill. A7	7.50 7.90†
Kans.City(48)	S5.7.65 8.05**
Kokomo C16	7.50 7.90†
LosAngeles B3	8.45 9.05*
Minnequa C10	7.65 8.05**
Monessen P7(48)	7.40 8.00††
Palmer,Mass. W12	7.80 8.20†
Pitts.,Calif. C11	8.45 8.85†
Portsmouth,O. P12	7.50
Rankin A7	7.50 7.90†
S.Chicago R2	7.50 7.90**
S.SanFran. C10	8.35 8.75**
Spar'wsPt. B2(48)	7.60 8.20*
Str'ling(1)(48)	N15 7.40 8.00††
Struth'rs,O.(48)	Y1 7.50 8.00‡
Worcester,Mass.	A7 7.80 8.20†

Based on zinc price of: *13.50c. †5c. ‖10c. ‡Less than 10c. ††13c. **Subject to zinc equalization extras.

BALE TIES, Single Loop — **Col.**

AlabamaCity,Ala. R2	175
Atlanta A11	175
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	*177*
Donora,Pa. A7	175
Duluth,Minn. A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla. M8	*182*
Joliet,Ill. A7	175
Houston S5	178
KansasCity,Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Pitts.,Calif. C11	199
S.Chicago R2	175
S.SanFran.,Calif. C10	197
SparrowsPoint,Md. B2	177
Sterling,Ill.(1) N15	173

FENCE POSTS — **Col.**

ChicagoHts.,Ill. C2, I-2	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	157
Johnstown,Pa. B2	157
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S10	160

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts
Full-Size Body (cut thread)
†½" x 6" and smaller 61
Larger than ½" diam. and all diams. longer than 6" 55
Under-Size Body (rolled thread; not nutted):
½" x 6" and smaller. 61

†½" x 4" and smaller and shorter are not nutted.

Carriage, Machine & Lag Bolts, Hot Galvanized:
½" and smaller 42
Larger than ½" diam. and all diams. longer than 6" 32

Lag Bolts
All diams. & 6" and shorter 61
All diams. longer than 6" 55

Plow, Tap & Blank Bolts
½" x 6" and smaller. 61
Larger than ½" diam. and all diams. longer than 6" 55

Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:
All sizes 61

STOVE BOLTS, SLOTTED
(nuts not attached; bulk)
⅛" to ¼" diam. incl., 3" or shorter:
25,000 to 199,999 pieces 61
200,000 or more pieces 64
5/16" to ½" diam., incl., 3" or shorter:
15,000 to 99,999 pieces 61
100,000 or more pieces 64
Longer than 3", any diam.:
5000 to 99,999 pieces. 61
100,000 or more pieces 64

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½-in., larger 9.95
⅝-in. under.. List less 32%

BOILER TUBES

Net base e.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.55	20.90
1¼	13	....	25.53	21.25
1½	13	24.24	28.22	23.50
1⅝	13	28.63	33.34	27.76
2	13	32.09	37.37	31.13
2¼	13	36.14	42.09	35.05
2½	12	39.23	45.67	38.05
2⅝	12	43.22	50.31	41.91
2¾	12	46.79	54.48	45.38
3	12	49.90	58.10	48.39

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	....
Huntington,W.Va. W7	....	....	....	5.65
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	....
Johnstown,Pa. B2	....	....	....(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	....(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	....
Williamsport,Pa. S19	....	....	....	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS, Untreated

Cleveland R2	12.15
KansasCity,Mo. S5	12.90*
Lebanon,Pa. B2	12.15
Minnequa,Colo. C10	12.15
Pittsburgh O3, P14	12.15
Seattle B3	12.65

*Treated

AXLES

Ind.Harbor,Ind. S13	7.50
Johnstown,Pa. B2	7.50

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.05
Ind.Harbor,Ind. Y1	8.05
Ind.Harbor,Ind. I-2	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	8.05
Minnequa,Colo. C10	7.90
Pittsburgh J5	8.05
Seattle B3	8.55
S.Chicago,Ill. R2	8.05
Struthers,O. Y1	8.05
Youngstown R2	8.05

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
98+% Fe, annealed	9.25
Swedish, c.i.f., Camden, N. J., c.l. in bags.	9.50
Domestic:	
F.o.b. Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N. J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, $6.50-$75.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb. drum frght. allowed	
Carlots	34.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	41.75-65.25†
Bronze, 5000-lb lots	67.50-71.75†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	62.75-65.25†
Phosphor-Copper, 5000-lb lots	68.75
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.25-33.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.85
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 29% Zn, 10% Ni. **84% Cu, 16% Zn, 18% Ni.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, $ cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; $33 & $52 for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 30c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & Lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.35c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 7.95c over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	2.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	4	...	10.5	....	13	....	14.5	....	14.5	....	14	....	16.5	....
Lorain, O. N3	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	23	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. P4	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless, Pa. N3	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	23	4.75	24.5	6.5
Fontana, Calif. K1	....	....	....	....	....	....	6	+13.25	9	+9.25	11.5	+5.75	14	+4
Ind. Harbor, Ind. Y1	....	....	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+12.5	7.5	+18	+0.5	+25	16.5	+0.75	19.5	3.25	23	6.75	24.5	8
Youngstown R2, Y1	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.80	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	....	....	....
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	14.5	+3	15	+2.5	16.5	+1.75	16.5	+1.75	7	+11.75	7	+11.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sparrows Pt., Md. B2	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling Ingot	Rerolling Slabs	Billets: Forging	Billets: Seamless Tube	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	34.75	35.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	38.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	42.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	43.25	45.25	48.00	52.25	52.25
305	23.25	30.25	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	23.50	30.50	38.50	44.25	41.25	43.25	45.50	48.75	52.00	52.00
309	31.00	39.75	46.75	53.50	53.50	52.00	54.75	56.25	67.00	67.00
310	37.25	48.00	62.25	72.25	68.50	69.75	73.50	75.25	78.75	78.75
314	....	....	....	....	....	69.75	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	57.75	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.50	63.25	62.75	65.75	69.00	73.25	73.25
317	37.25	48.25	62.75	72.75	75.50	70.75	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	43.00	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	46.75	52.25	53.25	50.75	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	58.00	58.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	34.50	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	....	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Chartier Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp., Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets Carbon Base 20%
302	....	....	36.50
304	36.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	28.80	33.35	....
410	28.30	32.85	....
430	28.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.05	....
Nickel, Low Carbon	43.25	60.06	....
Monel	42.35	56.36	....
Copper*	....	....	46.00

	Strip, Carbon Base—Cold Rolled: 10%	Strip, Carbon Base—Cold Rolled: Both Sides
Copper*	33.75	42.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.980

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	54.50	....	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.79	....	....
Buffalo District				
Buffalo H1, R2	60.00	60.50	61.00	61.50
Tonawanda,N.Y. W12	60.00	60.50	61.00	61.50
N.Tonawanda,N.Y. T9	....	60.50	61.00	61.50
Boston, deld.	70.65	71.15	71.65	....
Rochester,N.Y., deld.	63.02	63.52	64.02	....
Syracuse,N.Y., deld.	64.12	64.62	65.12	....
Chicago District				
Chicago I-3	60.00	60.50	60.50	61.00
Gary,Ind. U5	60.00	....	60.50	....
S.Chicago R2	60.00	....	60.50	....
S.Chicago,Ill. Y1	60.00	60.50	60.50	61.00
S. Chicago,Ill. U5, W14	60.00	....	60.50	61.00
Milwaukee, deld.	62.30	62.80	62.80	63.30
Muskegon,Mich., deld.	....	67.18	67.18	....
Cleveland District				
Cleveland R2, A7	60.00	60.50	60.50	61.00
Akron,O., deld.	63.75	63.25	63.25	63.75
Mid-Atlantic District				
Bethlehem,Pa. B2	62.00	62.50	63.00	63.50
NewYork, deld.	....	66.51	67.01	....
Newark, deld.	65.20	65.70	66.20	66.70
Birdsboro,Pa. B10	62.00	62.50	63.00	63.50
Chester,Pa. P14	62.00	62.50	63.00	....
Philadelphia, deld.	63.76	64.26	64.76	....
Steelton,Pa. B2	62.00	62.50	63.00	63.50
Swedeland,Pa. A3	62.00	62.50	63.00	63.50
Philadelphia, deld.	63.76	64.26	64.76	65.26
Troy,N.Y. R2	62.00	62.50	63.00	63.50
Pittsburgh District				
Neville Island,Pa. P6	60.00	60.50	60.50	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	61.95	61.95	62.45
McKeesRocks, deld.	....	61.60	61.60	62.13
Lawrenceville, Homestead, Wilmerding,Monaca, deld.	....	62.26	62.26	62.79
Verona,Trafford, deld.	62.29	62.82	62.82	63.35
Brackenridge, deld.	62.60	63.10	63.10	63.63
Bessemer,Pa. U5	60.00	....	60.50	61.00
Clairton,Rankin,S.Duquesne,Pa. U5	60.00	....	....	....
Midland,Pa. C18	60.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	60.50	....
Sharpsville,Pa. S6	60.00	....	60.50	61.00
Youngstown Y1	....	....	60.50	61.00
Youngstown U5	60.00	....	....	61.00
Mansfield,O., deld.	64.90	....	65.40	65.90
Duluth I-3	60.00	60.50	60.50	61.00
Erie,Pa. I-3	60.00	60.50	60.50	61.00
Everett,Mass. E1	62.00	62.50	63.00	....
Fontana,Calif. K1	67.50	68.00	....	....
Geneva,Utah C11	60.00	60.50	....	....
GraniteCity,Ill. G4	61.90	62.40	62.90	....
Ironton,Utah C11	60.00	60.50	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	62.00	62.50	63.00	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	60.00	60.50	60.50	61.00
Cincinnati, deld.	65.76	66.26	....	....

*Phos. 0.51-0.75%; $56. Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	69.00
Buffalo H1	70.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18 %; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Niagara Falls,N.Y. P15	$92.50
Keokuk,Iowa, Open-hearth & Fdry, (freight allowed K2)	97.00
Keokuk, O. H. & Fdry, 12½ lb pigiets, 16% Si, frgt allowed K2	100.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	72.50
Steelton,Pa. B2 (Phos. 0.035% max)	68.00
Philadelphia, deld.	71.55
Troy,N.Y. R2 (Phos. 0.035% max)	68.00
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Neville Island,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	65.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Galv. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.§	H.R. Alloy 4140††		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	7.42	...	9.39	....	7.63	7.49	9.48
Baltimore	7.24	8.35	8.50	....	7.70	7.70	...	8.49[9]	14.39	7.94	7.56	9.02
Birmingham	7.13	8.24	8.85	....	7.21	7.27	7.80	9.35	....	7.43	7.45	9.50
Boston	8.12	9.07	10.32	53.32	8.21	8.21	8.76	9.73	13.56	8.27	8.41	9.84
Buffalo	7.20	8.25	10.01	....	7.35	7.35	8.05	7.90	13.35	7.60	7.65	9.00
Chattanooga	7.28	8.44	8.60	....	7.36	7.42	7.95	9.18	....	7.63	7.60	9.32
Chicago	7.13	8.24	9.10	46.75	7.21	7.27	7.80	7.75	13.15	7.43	7.45	8.72
Cincinnati	7.25	8.23	9.10	46.10	7.45	7.51	8.04	8.15	13.29	7.90	7.74	8.97
Cleveland	7.13	8.24	8.95	49.16	7.31	7.33	7.86	8.00	13.11	7.76	7.62	8.89
Denver	8.95	10.31	11.73	....	9.10	9.10	...	9.82	17.87	8.95	9.10	10.50
Detroit	7.32	8.43	9.38	43.50	7.49	7.55	8.08	8.04	13.25	7.90	7.73	8.91
Erie, Pa.	7.08	8.24	8.95[10]	....	7.31	7.35	...	8.10[10]	....	7.85	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	8.25	...	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.46	8.52	9.22	....	7.44	7.59	8.12	9.44	....	7.75	7.77	9.44
Los Angeles	8.15	10.00	11.00	51.50	8.50	8.15	8.70	10.90	14.35	8.30	8.75	10.85
Milwaukee	7.22	8.33	9.19	....	7.30	7.36	7.89	7.94	13.24	7.60	7.54	8.81
Moline, Ill.	7.15	8.44	8.85	....	7.41	7.43	...	8.00	....	7.63	7.34	....
New York	7.78	8.88	9.63	53.13	8.23	8.16	8.71	9.77	13.47	8.11	8.21	9.50
Norfolk, Va.	7.35	...	...	....	7.80	7.85	...	9.95	....	8.10	7.60	9.10
Philadelphia	7.34	8.44	9.41	45.98	7.99	7.73	8.26	8.52	13.25	7.75	7.72	8.83**
Pittsburgh	7.13	8.24	9.40	49.00	7.21	7.27	7.80	8.00	13.05	7.43	7.45	8.72
Portland, Oreg.	7.80	8.80	10.65	....	8.00	7.95	...	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.25	...	9.49	....	7.85	7.85	...	9.50	....	8.10	7.50	9.35
St. Louis	7.42	8.53	9.69	43.89	7.50	7.56	8.09	8.29	13.44	7.83	7.74	9.01
St. Paul	7.46	8.59	9.16	....	7.72	7.74	...	8.51	13.51	7.94	7.65	9.12
San Francisco	8.20	9.85	10.15	51.65	8.35	8.15	8.70	11.45	14.35[8]	8.25	8.30	10.50
Seattle	7.85	10.50	10.90	54.00	8.90	8.60	9.15	12.25	14.65	8.50	8.50	10.70
Spokane, Wash.	8.90	11.25	11.05	....	9.05	8.75	9.30	12.40	15.55	8.65	8.65	11.35
Washington	7.78	9.80	8.60	....	8.49	8.24	...	9.49	....	8.51	8.11	9.56

*Prices do not include gage extras; †prices include gage and coating extras (based on 13.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **⅛-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted: Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 5000 lb except in Chicago, New York and Boston, 10 000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [8]—500 to 9999 lb; [9]—400 to 999 lb; [10]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [5]—2000 to 2999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over; [10]—2000 lb and over.

ROTARY SWAGING

is fast and economical

A wide variety of work can be performed by Torrington Rotary Swaging Machines—with unusual speed and economy.

The swaging time to shape this section of 1¾" tubing is only 6⅝ seconds. And the operation is easily and accurately performed by unskilled labor.

If your operations include reducing, tapering, pointing, sizing, bonding, forming inside contours or threads—rotary swaging offers many advantages over other methods.

Write today for our informative booklet on Torrington Rotary Swaging Machines. Or even better, ask to have a technical representative call to show you where rotary swaging can achieve new savings in your plant.

THE TORRINGTON COMPANY
Swaging Machine Division
150 North Street, Torrington, Conn.

Advantages of Rotary Swaging—

1 **Savings in material**—swaging is chip less—shapes the work instead of cutting metal away.

2 **Saving in labor**—swaging can be done by unskilled labor.

3 **Improved products**—swaging improves grain structure, tensile strength, resiliency and finish. Produces work accurate to ± .001" and better.

TORRINGTON "Job Tested" SWAGING DIES

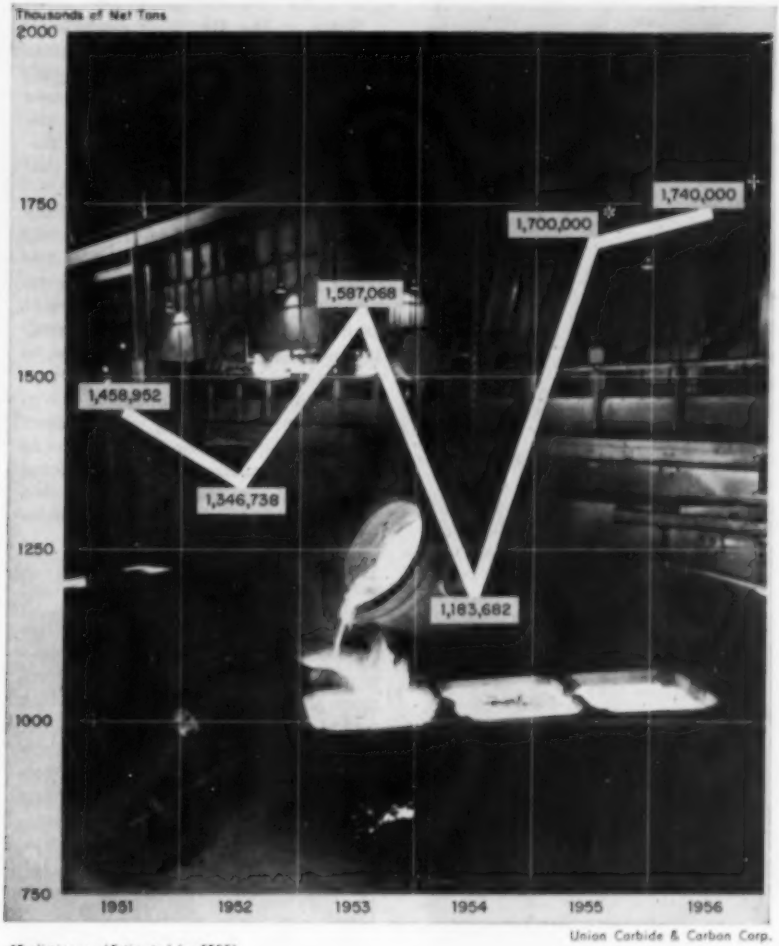
Torrington Job-Tested Swaging Dies—for the best in swaging machine dies—at economical prices, contact Torrington. All Torrington dies are job-tested before shipment.

90th ANNIVERSARY 1865–1955

TORRINGTON ROTARY SWAGING **MACHINES**

Makers of Torrington Needle Bearings

Steel's Take of Ferroalloys



Union Carbide & Carbon Corp.

*Preliminary †Estimated by STEEL
Source: American Iron & Steel Institute

Ferroalloy Demand Rises

Record steel production will set pace for alloying materials this year. Some expansion is needed in next few years, but no supply troubles appear

"BARRING unforeseen economic reverses, we anticipate a sales increase this year of 20 per cent over 1955," says J. G. Pritz, vice president of Ohio Ferro-Alloys Corp., Canton, O.

The "economic reverse" in the minds of most ferroalloy producers is a possible strike in the steel industry—now the only roadblock to a record year. Estimates range all the way from 5 per cent to Mr. Pritz's optimistic 20 per cent gain over the record set last year. Domestic production of all ferroalloys last year was about 2,406,000 tons, according to the American Iron & Steel Institute.

As Steel Goes—While the steel industry is not the only consumer of these alloying materials, it is certainly the biggest (see chart above). This year could see the mills turn out 122 million tons of steel (see STEEL, May 7, p. 143). Demand for alloy steel may not be as high as it was last year because of automotive cutbacks, but the over-all demand for ferroalloys will still be strong. Coupled with healthy foundry business, the consumption and production of ferroalloys this year will set records.

Most producers feel the industry has plenty of capacity to meet these increased demands, both now and in the immediate future. One sales manager told STEEL that over the next five years roughly 100,000 to 120,000 additional tons of ferromanganese capacity will have to be added to keep up with steel's expansion.

Under Way—The industry is not waiting for a shortage to develop. E. J. Lavino & Co., Philadelphia, is revamping an old furnace in Lynchburg, Va., which was shut down about five years ago. It will be in operation next November. Vanadium Corp. of America, New York, is going to build a new plant near New Alexandria, O. While the main product will be ferrochromium—a real "comer," according to some observers—it may also produce some ferromanganese, ferrovanadium and ferrosilicon. Four electric furnaces likely will be involved.

Pittsburgh Coke & Chemical Co., Pittsburgh, this month announced the formation of Neville Ferro Alloy Co., a wholly owned subsidiary, to produce ferromanganese and other ferroalloys. Production may be started this year. Ohio Ferro-Alloys, which has expanded 40 per cent since last June, has plans to gear its growth to the demands of the iron, steel and aluminum industries. In fact, practically all producers indicate a readiness to expand should demand require it.

Supply Problems—While the supply of most ores from which ferroalloys are made is not a problem, it could be in the future. For some of the more important ones—ferromanganese and ferrochromium, for instance—the U. S. is a have-not nation. There are plenty of these ores to be had, as long as our country is on friendly terms with the countries which have them, mainly India, Africa and South America. But the cost of shipping is becoming a big problem. H. M. Rich, vice president of sales for Electro Metallurgical Division, Union Carbide & Carbon Corp., New York, says few of these countries have adequate rail systems to get the ores to the docks. "Once they are at the dock," he says, "shipping costs have risen to such a degree that it is becoming economically unsound to ship from some areas of the world."

This means that ferroalloys are getting more expensive. Manganese ores have risen about 26 per cent since January, 1955; chromium ores about 16 per cent. "We do not believe the end is in sight," says Mr.

Pritz of Ohio Ferro-Alloys. Most producers agree with him. Freight increases and wage negotiations this summer will force prices higher.

Domestic Sources?—If the price were to rise high enough, it might be possible to develop some domestic sources for some of the have-not ores. There are some low-grade deposits of manganese ores in the U. S. Some manganese could be recovered from steel mill slag piles in an emergency. And some observers claim that sufficient tungsten could be mined in this country to warrant greater use by the military. Stockpile purchases have helped such developments, but some of the government's purchasing programs for strategic materials are scheduled to close on May 31.

There are trends within the industry well worth noting. Demand for ferrotitanium probably will increase. It is used in Type 321 stainless and for some jet alloys. New nonmilitary uses are developing in the electronic and chemical industries. While titanium scrap may be cutting into the demand, most producers feel there is not enough pure scrap to worry about this too much.

Good, but—Ferrochromium also has a bright future, especially in stainless steel production. The main danger here is that when and if nickel becomes easier to get, the demand for the 400 series stainless steels will drop off and so will ferrochrome sales. That will not be for another two years at least, however (see STEEL, May 21, p. 80).

Tin Plate . . .

Tin Plate Prices, Page 182

Tin plate demand continues strong and full-scale operations in the third quarter appear assured. Demand for cans and containers seems to assure full production the entire year.

Steady increases in the canning of fruits, vegetables and juices on the Pacific Coast and Hawaii have helped push national can production higher every year. Total output of cans and containers this year is expected to reach 40 billion.

Wire . . .

Wire Prices, Pages 182 & 183

Manufacturers wire demand has lost some of its zip. At the same time, specifications for merchant wire products, while slightly improved, are disappointing at most market centers. Fencing demand is reported lagging badly, to some extent reflecting depressed conditions in the rural areas. Nail business, however, is definitely improved.

Consumers of industrial wire items are reported to have built up inventory to normal level in the East. Relatively few users, however, have loaded up in anticipation of an expected price advance, or the possibility of a steel strike at midyear.

Most consumers are marking time on third quarter needs. They are slow to enter July-August orders. Cutbacks, however, are largely confined to automotive volume. The outlook for auto business continues clouded.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 181 & 182

A buyers' market in sheet and strip has developed, temporarily at least, in some districts. Sellers will have to intensify their selling activity in the third quarter, particularly on cold-rolled sheets.

"There won't be any tailspin in cold-finished sheet sales in the third quarter, despite evidence that auto and appliance production will be slowed," reports the sales manager of a major Pittsburgh area producer. That firm and others expect July and August will be slow in cold-finished sheet sales, but that shipments should begin to climb again in September.

At the same time, shipments may climb in other sheet items, including electrical, hot rolled and galvanized. Mills are planning possible changes in product mix which would enable them to meet gains in demand for strip and tin plate. There's also much unfilled hot-rolled sheet demand. The government's grain bin program should result in heavier requirements for galvanized sheet.

Sellers so far have been successful in disposing of July and August tonnages of cold-rolled sheets canceled or deferred by automotive customers. One large producer in the Mid-Atlantic district in disposing of such spot tonnages makes clear to the buyers that the purchases do not set up a pattern for the fourth quarter, which is expected to be more active. Resumption of volume buying for 1957 automobile models is expected in September or October.

Expiration of mill lead time indicates that some auto makers are specifying only 50 to 60 per cent of the tonnages available to them. Most consumers are taking their full quotas, although two stove manufacturers in the East canceled May tonnages. One mill in the Chicago district estimates that half of its customers don't have inventories as large as desired.

Hot-rolled carbon sheet and tin mill black plate demand holds relatively better than other flat-rolled products.

Warehouse . . .

Warehouse Prices, Page 185

News of the United Steelworkers' wage demands caused small manufacturers to review their inventory positions and to increase June purchases of products low in stock. The possibility of a steel strike is being discussed freely among warehouse customers.

Steel products generally are becoming more freely available to distributors. Extra allotments of cold-finished sheet and bars have been offered for third quarter delivery. Plant shutdowns for vacations and maintenance are expected to slow steel purchasing in that period, as most small fabricators cut down on inventories which are being accumulated.

Volume of business in plates and shapes is excellent, bookings being limited only by the tonnage distributors are able to obtain from mills.

Steel Bars . . .

Bar Prices, Page 180

Hot-rolled carbon bar specifications are coming in well for next quarter, but the volume will be down from that in the current contracting period.

Cold finishers have eased up a trifle in their hot bar specifications. Spotty demand from other consuming areas is noted, particularly automotive and appliance accounts. Pressure for quick deliveries is gradually fading, notably on the Pacific Coast.

Shipments of hot-rolled still trail promised delivery dates by as much as a month in certain sizes, but the mills are steadily catching up with backlogs. The 13 and 14-in. mill sizes are said to be in tightest supply.

Atlantic Steel Co. raised the base prices on bars $6 a ton a week ago, as noted in STEEL, May 21 issue. This puts the company's price $10 per ton over the general market. High scrap costs figure in the increase. Atlantic is building an $8.5-million bar and rod mill at its works in Atlanta.

New extra books, dated May 15, 1956, covering changes for special quality hot-rolled carbon bars, merchant quality hot-rolled carbon bars and forging billets, have been issued by Republic Steel Corp., Cleveland. Most changes are in the extras for chemistry, and a few are related to loading and packaging.

Youngstown Sheet & Tube Co. announced it was increasing certain extras, including those for alloy grade, applicable to hot-rolled bars,

hot-rolled sheets and strip, plates and semifinished. The new lists, which are being printed, went into effect May 16.

Plates . . .

Plate Prices, Page 180

There is not much change in the tight plate supply situation. A little more strip-plate is coming onto the market as pressure for sheets eases, and somewhat more gray market tonnage appears to be available at a few points.

In general, however, demand continues just as strong as ever, with no letup expected in either the third or fourth quarter.

Two independent plate mills in the East, up to the end of the week beginning May 21, hadn't opened their books for third quarter orders. This delay is because they are making an effort to get their production in better balance with their arrearages.

The volume of light plates from the strip mills, including low alloy bolster tonnage for car shops, is larger in New England.

Most plate mills are booking a minimum of narrow light gages. Producers that are booked through July only are arbitrarily turning back tonnage to keep up with their delivery promises. As a result, plate deliveries in some cases are close to schedule.

Clad shipments run eight to ten weeks and heads 10 to 12.

Freight car builders are exerting terrific pressure on midwestern plate sellers, but the outlook is that supplies will continue tight throughout the year regardless of what happens in general steel demand. Numerous consumers in the Midwest seek to make conversion arrangements, but there is neither finishing capacity nor semifinished steel available to make conversion possible on any large scale.

Rails, Cars . . .

Track Material Prices, Page 183

Freight cars placed in April increased to 6559, the largest number awarded in any month this year. The total, says the American Railway Car Institute, compares with 1618 in March and 2706 in April of 1955.

Railroads accepted deliveries of 5943 cars last month, just six cars short of the March total. The March figure of 5949 was the largest since November, 1953, when 6137 were delivered.

Backlogs as of May 1 were 137,436, compared with 137,070 on Apr. 1, and 17,930 a year ago.

Holding down shipping costs

...is a cinch with Behr-cat filament-reinforced strapping tape on the job. Behr-cat sticks at a touch without wetting, assures fast, neat bundling, and provides simple, easy unwrapping for your customers. Try it today. Behr-Manning, Troy, N. Y.

In Canada: Behr-Manning (Canada) Ltd., Brantford.
For Export: Norton Behr-Manning Overseas Inc., New Rochelle, N. Y., U. S. A.

T-3

BEHR-MANNING ® division of NORTON Company

▲ COATED ABRASIVES
▲ SHARPENING STONES
▲ PRESSURE-SENSITIVE TAPES

Structural Shapes . . .

Structural Shape Prices, Page 180

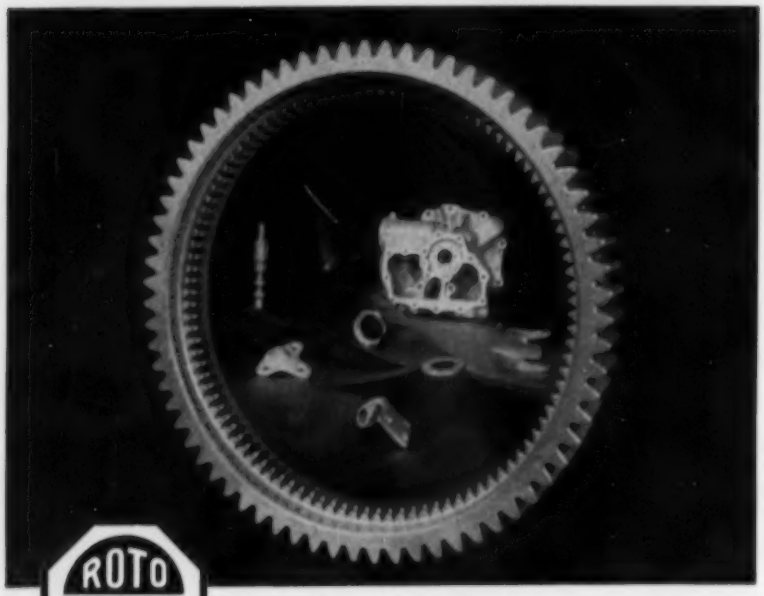
Extended structural steel deliveries continue to result in the diversion of a substantial number of small jobs to reinforced concrete construction. For example, on state bridge work for Pennsylvania, out recently for June 8 bidding, several projects call for precast construction.

Normally, these jobs would take structural steel. Only one bridge in this group calls for structural steel, and that is because it is fairly large —398 tons.

Structural activity is undergoing a slight lull in the New York area. This appears due not only to the extended delivery position of fabricators but also to a disposition on the part of builders to mark time until the steel labor and price situation is clarified. Contributing to extended structural deliveries, of course, is continued stringency in plain material.

Less fabricated structural tonnage is being estimated in New England. The decline in volume is mostly in bridges with only about 2000 tons currently active for a score or more small spans, mostly beam structures. All structural steel, 77,800 tons, is under contract for the Connecticut turnpike. Eight shops are fabricating 20 contracts, and additional tonnage for this project will be out shortly, with deliveries extending one year to 14 months.

Gray market operators are reportedly offering larger amounts of structurals for third quarter delivery. Some buyers think the improved availability of tonnage in the gray market indicates the market generally will loosen up in the third and fourth quarters. The mills, however, give no encouragement to this view, with structurals and plates the major steel products in tightest supply. The situation is particularly acute in wide flange sections.



ROTO FINISH

it's the finish that counts!

Roto-Finish maintains exact tolerances on precision parts with no significant dimensional changes. It makes possible a wide range of finishes applicable to parts of almost any size or shape; finishes a variety of materials — at big savings in manpower and costs. Without obligation, send sample unfinished parts to us. Include finished part for guide and your specifications. Roto-Finish will finish parts in its laboratory. You get a complete process report. You are guaranteed results and a finish that counts!

WRITE FOR FACT-PACKED ROTO-FINISH CATALOG NOW

Roto-Finish COMPANY

3717 Milham Road, Kalamazoo, Michigan

Originators of the Roto-Finish Process

P. O. Box 988

Phone 3-5578

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1400 tons, 8-story building, Deering Milliken Co., Avenue of the Americas and 39th street, New York, through Turner Construction Co., contractor, to Schacht Steel Construction Inc., New York.

750 tons, manufacturing building, Robert E. Lamb & Son, for leasing to the Penco Division, Alan Wood Steel Co., Oaks, Pa., to Eastern Steel Structures, Easton, Pa.

575 tons, three state highway bridges, Concord, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; Munroe & Langstroth Co., Boston, bridge contractor.

500 tons, Chief Logan joint high school, Burnham, Pa., to Goetz Welding Co., Harrisburg, Pa.

425 tons, state sanitorium, Philadelphia, to Bethlehem Steel Co., Bethlehem, Pa.

350 tons, state highway bridges, Southeast expressway, Savin Hill district, Boston, to West End Iron Works, Cambridge, Mass.; Wes-Julian Construction Corp., Dedham, Mass., general contractor; reinforcing bars to Bethlehem Steel Co., Bethlehem, Pa.

345 tons, state highway bridge, Brooklyn-Killingly, Conn., to Phoenix Bridge Co., Phoenixville, Pa.; Enfield Roads Construction Co., Thompsonville, Conn., general contractor.

330 tons, boiler house, E. J. Lavino & Co., Lynchburg, Va., through Albert J. Woods Associates, contractor, to Belmont Iron Works, Eddystone, Pa.

325 tons, building, Pottsgrove, Pa., to Bethlehem Steel Co., Bethlehem, Pa.

275 tons, state highway bridges, Andover, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; R. G. Watkins Co., Amesbury, Mass., general contractor.

115 tons, Barre Falls dam, Corps of Engineers, Ware, Mass., to Bethlehem Steel Co., Bethlehem, Pa.; Lane Construction Co., Meriden, Conn., general contractor.

100 tons, Home for Aged Men, Boston, to A. O. Wilson Structural Co., Cambridge, Mass.

STRUCTURAL STEEL PENDING

3000 tons, second unit of teaching hospital, University of Washington, Seattle; Sound Construction & Engineering Co., Seattle, apparently low on three schedules at $5,043,795.

705 tons, ramp, Pennsylvania approach to Philadelphia-Gloucester bridge for the Delaware River Port Authority, Kaufman Construction Co., general contractor.

398 tons, state bridge, Lehigh county, Pa.; bids June 8.

235 tons, state highway bridge, Quinebaug river, Putnam, Conn.; 55 tons of reinforcing also required.

135 tons, three state bridges, Thompson-Pomfret-Killingly, Conn.; 60 tons of reinforcing also required.

130 tons, wide flange, high tensile, low alloy, East and West Coasts; bids to Navy General Stores Office, Philadelphia.

120 tons, organizational buildings, Eielson Air Base, Alaska; bids in.

195 tons, two state bridges, Willamantic river, Coventry, Conn.; 55 tons of reinforcing also required.

100 tons, three state highway bridges, Stafford, Conn.; 50 tons of reinforcing also required.

65 tons, also miscellaneous, Frenchman Springs project, Washington state; bids to Denver, May 25.

50 tons, steel supports, also miscellaneous steel; 3650 linear ft. tunnel, Rogue river project, Medford, Oreg.; bids to Denver May 31.

REINFORCING BARS . . .

REINFORCING BARS PLACED

2000 tons, Morrison street bridge approaches, Portland, Oreg., to Soule Steel Co., Portland; Kuckenberg Construction Co., Portland, general contractor.

1865 tons, 11 grade separations and three bridge substructures, Connecticut turnpike project 312-01, Bridgeport-Stratford, to Bethlehem Steel Co., Bethlehem, Pa.; L. G. DeFelice & Son Inc., North Haven, Conn., general contractor; 102,500 linear ft. mostly 14-in. steel pipe piling, to National Tube Division, U. S. Steel Corp., Pittsburgh.

1715 tons, 15 grade separations and three stream-crossing bridges, Connecticut turnpike project 321-01, Guilford-Clinton-Madison-Westbrook, to Bethlehem Steel Co., Bethlehem, Pa.; Lane Construction Co., Meriden, Conn., general contractor; 1350 tons, steel piling, to Bethlehem Steel Co., Bethlehem, Pa.

500 tons, library, University of Idaho, Moscow, Idaho, to Soule Steel Co., Seattle.

100 tons, Alaska military installation, to Bethlehem Pacific Coast Steel Corp., Seattle.

100 tons, McMillan reservoir, No. 2, Tacoma, Wash.; general contract to Cherf Bros. & Sandkay Contractors Inc., Ephrata, Wash., low at $529,576.

REINFORCING BARS PENDING

30,000 tons, reinforcing and anchor bars, Priest Rapids dam and power plant, Columbia river, near Richland, Wash.; Merritt-Chapman & Scott Corp., New York, is low.

3400 tons, Holgate street addition to Alaskan viaduct, Seattle; bids to Olympia, Wash., highway commission, June 19.

800 tons, addition to teaching hospital, University of Washington, Seattle; bids in.

100 tons, state bridge, Blair county, Pa.; bids June 8.

100 tons, Washington state girder bridge, Lewis county; general contract to Frank Pakar, Chehalis, Wash., low at $39,860.

100 tons, Washington state girder overcrossing, Kitsap county; bids to Olympia, Wash., May 27.

50 tons, also trashracks, etc.; diversion tunnel, Cougar dam, McKenzie river, Oregon; Northwood Inc., Portland, Oreg., is low at $571,636 to U. S. Engineer, Portland.

Unstated, four Nike installations near Eielsen Air Base, Alaska; bids to U. S. Engineer, Seattle, June 14; each a $1 million project.

Unstated, University Branch, Seattle First National Bank; general contract to George E. Teufel Co., Seattle, low at $178,000.

Unstated, Montana state highway projects, four highway bridges, total length 504 ft, Big Horn Lake and Carbon counties; bids to Helena, Mont., June 4.

PLATES . . .

PLATES PLACED

4400 tons, including shapes, welded girder approaches to Morrison and Hawthorne Bridges, Portland, Oreg., to Gunderson Bros. Engineering Co., Portland; general contract to Kuckenberg Construction Co., Portland, low at $4,789,961 to Multnomah county commissioners.

PLATES PENDING

350 tons, 30,000-bbl bulk fuel storage tank with vapor dome, Fairchild Air Base, Wash.; bids to Corps of Engineers, Seattle, about June 13.

300 tons, two 75,000-bbl fuel storage tanks, naval base, Guantanamo Bay, Cuba; bids June 5 to Tenth Naval District, San Juan, P.R.

150 tons, 20,000-bbl storage, Fairchild Air Base, Spokane, Wash. (previously reported unstated); bids to U. S. Engineer, Seattle, June 13.

100 tons, water tank; bids to Spokane, Wash., May 24.

Unstated, four $1-million Nike installations, Alaska, fuel storage facilities; bids to U. S. Engineer, Seattle, June 14.

PIPE . . .

CAST IRON PIPE PENDING

532 tons, 16 and 12 in., municipal requirements; bids to Seattle May 24.

500 tons, 16 to 4 in., Bremerton, Wash.; bids in.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Belt of Chicago, two diesel-electric road switchers, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

Chicago & Eastern Illinois, four diesel-electric road switchers, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

RAILROAD CARS PLACED

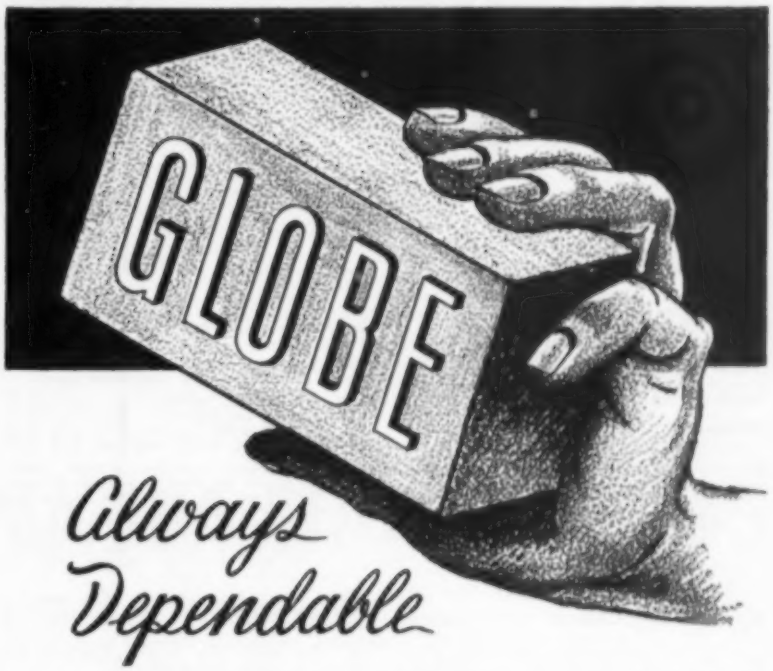
Atlantic Coast Line, shells for a baggage-dormitory car, a dining car and a baggage car, to Pullman-Standard Car Mfg. Co., Chicago.

Canadian National, 2150 freight cars placed, with Canadian Car & Foundry Co. Ltd., Montreal, and the National Steel Car Corp. Ltd., Hamilton, Ont., receiving orders for 1000 fifty-ton boxcars, the Eastern Car Co. Ltd., Sydney, Nova Scotia, 150 thirty-ton box cars. These are in addition to 1880 recently noted as placed by the Canadian National.

RAILROAD CARS PENDING

Headquarters, Transportation Supply & Maintenance Supply, St. Louis, one 50-ton boxcar, bids May 29.

Western Fruit Express, 200 refrigerator cars; contemplated.



SUPERIOR LADLE BRICK

The greater heat resistance of GLOBE brick is well known in the steel industry. Because these bricks, wire cut or dry pressed, last longer—saving much time lost in refractory replacement—they help increase melting capacity. There is a type for every need, so let us place our experience at your disposal.

Lowers Per Ton Cost and Increases Melting Capacity

SERVING THE STEEL INDUSTRY SINCE 1873

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO

Current Ferroalloy Quotations

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Pa. 21-23% Mn, $96.50; 19-21% Mn, 1-3% Si, $94; 16-19% Mn, $92.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton $215. Duquesne, Johnstown, Sheridan, Pa.; Philo, O.; Tacoma, Wash.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively.

(Mn 79-81%). Lump $223 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 31.95c per lb of contained Mn, carload packed 33c, ton lots 34.5c, less ton 35.7c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.30% C, 2.5c for max 0.50% C, and 0.5c for max 7% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk 22.85c per lb of contained Mn, packed, carload 23.9c, ton lot 25.5c, less ton 26.7c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 96.5% min, Fe 2% max, Si 1% max, C 0.2% max). Carload, lump, bulk, 45c per lb of metal; packed, 48.75c; ton lot 47.25c; less ton lots 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 31.5c; 2000 lb to min carload, 33.5c; 250 lb to 1999 lb, 35.5c; less than 250 lb, 36.5c. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12c per lb of alloy. Packed, c.l. 13c, ton 13.45c, less ton 14.45c, f.o.b. Alloy, W. Va., Ashtabula, O., Marietta, O., Sheffield, Ala., Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lots 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lots $1.35, less ton $1.37 f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%. Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk 28.25c per lb of contained Cr; c.l. packed 27.8c, ton lot 29.25c, less ton 30.65c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-71%). Contract, carload, lump, bulk, C 0.025% max (Simplex) 31.75c per lb contained Cr, 0.02% max 38.50c, 0.03% max 36c, 0.06% max 36.50c 0.1% max 36c, 0.15% max 35.75c, 0.2% max 35.50c, 0.5% max 35.25c, 1.0% max 34c, 1.5% max 33.85c, 2.0% max 33.75c. Ton lot, add 3.1c, less ton add 4.8c. Carload packed add 1.45c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, High-Carbon: (Cr 62-66%, C 5-7%, Si 7-10%). Contract, c.l. 2 in. x D, bulk 27.4c per lb contained Cr. Packed, c.l. 28.7c, ton 30.8c, less ton 32c. Delivered. Spot, add 0.25c.

Foundry Ferrochrome, Low-Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed 8 M x D, 19.6c per lb of alloy, ton lot 20.85c; less ton lot, 22.05c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome-Silicon: (Cr 39-41%, Si 42-49%, C 0.05% max). Contract, carload, lump, 4" x down and 2" x down, bulk, 39.05c per lb of contained Cr; 1" x down, bulk 39.8c. Delivered.

Chromium Metal, Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2 max). Contract, carlot, packed 2" x D plate (about ¼" thick) $1.25 per lb, ton lots $1.27, less ton lots $1.29. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth Grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.10 per lb of contained V. Delivered. Spot, add 10c. **Special Grade** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.20. **High Speed Grade** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.30.

Grainal: Vanadium Grainal No. 1, $1.05 per lb; No. 6, 65c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots, packed, $1.33 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.75c per lb of contained Si. Packed, c.l. 14.85c, ton lot 16.3c, less ton 17.95c. F.o.b. Alloy, W. Va., Ashtabula, Marietta, O., Sheffield, Ala., and Portland, Oreg. Spot, add 0.45c.

Low Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.2c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 14.5c per pound contained silicon. Packed, c.l. 16.2c, ton lots, 18c; less ton, 19.35c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 15.4c per lb of contained Si. Packed, c.l. 17.05c, ton lot 18.7c, less ton 19.95c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si. Packed, c.l. 19.95c, ton lot 21.35c, less ton 22.4c. Delivered. Spot, add 0.25c.

Silicon Metal: (Min 98% Si, 0.75% max Fe, 0.07 max Ca). C.l. lump, bulk, 20.5c per lb of Si. Packed, c.l. 21.95c, ton lot 23.25c, less ton 24.25c. Add 0.5c for max 0.03 Ca grade. Deduct 0.5c for max 2% Fe grade analyzing min 96.5% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy, ton lots packed 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 8.5c per lb of alloy. Packed, c.l. 9.5c, ton lot 10.65c, less ton 11.5c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 26.25c per lb of alloy, ton lot 27.4c, less ton 28.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over, are as follows: Grade A (10-14% B) 85c per pound; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Boral: (3 to 4% B, 40 to 45% Si). $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5%-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 22c per lb of alloy, carload packed 23.05c, ton lot 24.95c, less ton 25.95c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 21.5c per lb of alloy, carload packed 22.95c, ton lot 25.25c, less ton 26.75c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3% lb each and containing 2 lb of Cr). Contract, carload, bulk, 16.95c per lb of briquet, carload packed in box pallets 17.15c, in bags 17.85c; 3000 lb to c.l. in box pallets 18.35c; 2000 lb to c.l. in bags, 19.05c; less than 2000 lb in bags 19.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing 2 lb of Mn). Contract, carload, bulk 13c per lb of briquet, c.l. packed, pallets 13.2c, bags 14c; 3000 lb to c.l., pallets 14.4c; 2000 lb to c.l. bags, 15.2c, less ton 16.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 13.55c per lb of briquet, c.l. packed, pallets, 13.75c; bags 14.55c, 3000 lb to c.l., pallets, 14.95c; 2000 lb to c.l., bags, 15.75c; less ton 16.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.15c per lb of briquet; packed, pallets, 7.35c; bags, 8.15c; 3000 lb to c.l., pallets, 8.95c; 2000 lb to c.l. bags 9.75c; less ton 10.65c. Delivered. Spot, add 0.25c.

(Small size—Weighing approx. 2½ lb and containing 1 lb of Si). Carload, bulk 7.3c. Packed, pallets 7.8c; bags 8.30c; 3000 lb to c.l. pallets 9.1c; 2000 lb to c.l. bags 9.9c; less ton 10.8c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.53 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $3.45 per lb of contained W; 2000 lb W to 5000 lb W, $3.55; less than 2000 lb W, $3.67. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Contract, ton lot, 2" x D, $6.90 per lb of contained Cb. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb plus Ta 60% min C 0.30% max). Ton lots, 2" x D, $4.65 per lb of contained Cb plus Ta, delivered; less ton lots $4.70.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.) Contract, c.l. packed ½ in. x 12 M, 18.5c per lb of alloy, ton lots 19.65c, less ton 20.9c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18.5c per lb of alloy, ton lots 19.65c; less ton lots 20.9c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-S Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 17.2c per lb of alloy; ton lots 18.7c; less ton lots 19.95c, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 17.50c. Packed c.l. 18.50c, 2000 lb to c.l. 19.50c, less than 2000 lb 20c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base; carload, f.o.b. sellers' works, Mt. Pleasant, Elgio, Tenn., $90 per gross ton.

Ferromolybdenum: (55-75%). Per lb contained Mo, in 200-lb containers, f.o.b. Langeloth, Pa., $1.54 in all sizes except powdered which is $1.66; Washington, Pa., furnace, any quantity $1.46

Technical Molybdic-Oxide: Per lb contained Mo, f.o.b. Langeloth, Pa.; $1.31 in cans; in bags, $1.30, f.o.b. Langeloth, Pa.; $1.24, Washington, Pa.

31 experts collaborated

Greatest book ever written about making iron and steel

440 pages 8½" x 11"

An illustration on every page

ORDER YOUR COPY OF THIS AMAZING BOOK TODAY!

Everyone in your plant— from top executive to apprentice—will benefit from the use of this book.

It represents years and years of constant "on-the-job" experience in every branch of iron and steel making—every statement in it rings with the authority of actual, first hand experience.

No *one* man could have written this book. It required the combined skills of 31 of the nation's foremost experts . . . men like Charles L. McGranahan on hot and cold-rolled strips and sheets; Waldemar Naujoks on forgings; Alfred E. Kadell on tin plate, and 28 others of equal stature.

Although this book is the work of skilful, highly trained specialists, it is written in simple, non-technical language that the youngest apprentice can understand. To make things even more clear, photographs, charts and other visual aids are employed throughout.

Here's how to order the number of copies you need—

10 DAY FREE TRIAL

THE PENTON PUBLISHING CO.
Book Department
1213 West Third Street, Cleveland 13, Ohio

send me a copy of "the ABC of Iron and Steel"

- ☐ On ten days trial for free examination, following which I will pay for the book at $10, plus postage, or return it in good condition.
- ☐ Remittance enclosed* in which case the book will be sent prepaid.
- ☐ C.O.D.

SIGNED _____ TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

*Add 30 cents to cover state sales tax on orders for delivery in Ohio.

MUNDT

a name with over 83 years experience ready to serve the industry at all times with the

PERFORATED

requirements necessary for your equipment, machinery or parts in any form or types of

METAL

or fibre, cardboard, paper, soundboards and other materials in a workmanlike manner that

MEANS

lasting performance, better quality, and above all a product that will give you a

PERFECT

job for the particular purpose for which it is to be used, without defects, burrs or camber to

SCREENS

because our up-to-date equipment, plus our engineering counsel gives you nothing but the best.

Specially Fabricated for ALL INDUSTRIES BY

CHARLES MUNDT & SONS

53 FAIRMOUNT AVE.
JERSEY CITY 4, N. J.
PHONE—DELAWARE 3-6200

Send for Illustrated Catalog

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-66%	20.00
N. African hematite (spot)	nom. 18.60-20.00
Brazilian iron ore, 68-69%	13.00c, f.o.b. Victoria.

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$33.00-$35.50
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, delivery within six months, $1.15 nom. per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.05 nom.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$26.00
48% no ratio	33.00-35.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked	$1.10

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.60-$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills	
Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Parber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Pa., New Savage, Md., St. Louis, $150.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Windham, Portsmouth, O., Hawstone, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $145; Morrisville, Pa., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $194; Danville, Ill., $197; Philadelphia, Clearfield, Pa., $201.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $241; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Philadelphia, Clearfield, Pa., $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.80; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $258.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $196.50.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Bilimeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ⅛-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅜-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Birmingham, ovens	$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Buffalo, deld.	28.75
Camden, N. J., ovens	26.50
Chicago, ovens	27.00
Chicago, deld.	28.50
Detroit, ovens	27.50
Detroit, deld.	*28.75*
Pontiac, deld.	*29.15*
Saginaw, deld.	*30.71*
Erie, Pa., ovens	27.50
Everett, Mass., ovens New England, deld.	*28.55
Indianapolis, ovens	26.75
Ironton, O., ovens	26.00
Cincinnati, deld.	28.59
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island, (Pittsburgh) Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
St. Louis, ovens	28.50
St. Paul, ovens	26.50
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	*$32.00*
Birmingham area	*36.00*

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length (Inches)	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

no family resemblance... but they're all Industrial Advertising!

Mention industrial advertising and the first thing that comes to mind is space in a publication. This is entirely natural, since the 2,000 or more technical, industrial, trade and business papers in the United States and Canada carry a huge amount of industrial advertising. Space in these publications is the "backbone" of most industrial advertising campaigns.

Yet publication space is only part of industrial advertising, for industrial advertising includes *every means, other than personal selling, employed to create a favorable attitude toward a company or product.* It utilizes such diverse media as motion pictures, exhibits, direct mail in its many forms, product publicity, technical and sales promotion bulletins, catalogs, instruction books, and dozens of other sales devices. Industrial advertising is effective when all pertinent media are knit together into a purposeful program.

Through such programs, new methods and new products are introduced; the market for old products is expanded. Industry grows—and our whole economy grows with it.

All of us, as consumers, profit by that growth for never in the world's history has the consumer been offered so much in goods and services. *And never in history have goods been cheaper in terms of the number of hours of work required to earn their purchase price.*

National Industrial Advertisers Association, Inc.

271 Madison Avenue, New York 16, New York

An organization of over 4000 members engaged in the advertising and marketing of industrial products, with local chapters in ALBANY, BALTIMORE, BOSTON, BUFFALO, CHICAGO, CLEVELAND, COLUMBUS, DALLAS-FORT WORTH, DENVER, DETROIT, HAMILTON, ONT., HARTFORD, HOUSTON, INDIANAPOLIS, LOS ANGELES, MILWAUKEE, MINNEAPOLIS-ST. PAUL, MONTREAL, QUE., NEWARK, NEW YORK, PHILADELPHIA, PITTSBURGH, PORTLAND, ROCHESTER, ROCKFORD, ST. LOUIS, SAN FRANCISCO, TORONTO, ONT., YOUNGSTOWN.

Know How and RESPONSIBILITY are behind "WHEELS by F&H

Our constant search for wheel improvement takes ALL factors into account—

- The design of WHEELS and HUBS
- The design of SPINDLES and AXLES
- Selection of adequate anti-friction BEARINGS
- Selection of suitable closure SEALS
- Selection of types and sizes of rubber TIRES

INTEGRATED ENGINEERING · F&H · Since 1888

May we assist you in cost reduction through our PACKAGE PLAN?

FRENCH & HECHT
DIVISION
KELSEY HAYES WHEEL COMPANY
DAVENPORT, IOWA

DYKEM STEEL BLUE

Stops Losses making Dies and Templates

Popular package is 8-oz can fitted with Bakelite cap holding soft-hair brush for applying right at bench. metal surface ready for layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief prevents metal glare Increases efficiency and accuracy

Write for sample on company letterhead

THE DYKEM COMPANY
2303H North 11th St. • St Louis 6, Mo.

INTRODUCTION TO THE STUDY OF HEAT TREATMENT OF METALLURGICAL PRODUCTS

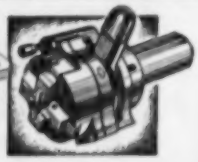
By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

246 pages — 4 tables
69 Illustrations — Price $5.00 Postpaid

THE PENTON PUBLISHING CO.
Book Department, 1213 W. 3rd St., Cleveland 13, O.

H&C Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, low chaser costs, less downtime, more pieces per day.

THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: *A. C. Berbringer, Inc., 334 N. San Pedro St., Los Angeles, California.* Canada: *F. P. Barber Machinery Co., Toronto, Canada.*

STEEL TUBING
SEAMLESS or WELDED
AIRCRAFT - MECHANICAL
PRESSURE - STAINLESS
STAINLESS PIPE & FITTINGS
SERVICE STEEL
DETROIT · BUFFALO · CHICAGO · CINCINNATI · LOS ANGELES

for Corrugating and Complete Line of Culvert Equipment—Slitting and Coiling Equipment for Ferrous and Non-Ferrous Material in All Capacities—Warehouse and Steel Mill Cut to Length Lines for Shearing and Levelling Sheets from Coils—Shears for Shearing Sheets and Plates Both Underdriven and Overdriven Types in Capacities to 1¼" Plate.

STAMCO, Inc., New Bremen, Ohio

MODERN ELECTROPLATING

881 PAGES
ILLUSTRATED

Price $8.50 Postpaid

BY ALLEN G. GRAY, Technical Editor, STEEL Magazine.

Brings you a complete, up-to-date one-volume summary of current industrial electroplating processes. The only book that emphasizes both practical aspects and basic theory. The Penton Publishing Company, Book Department, 1213 West Third St., Cleveland 13, Ohio.

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

Scrap . . .

Scrap Prices, Page 198

Pittsburgh—An independent mill's purchase of No. 1 heavy melting scrap for $49, No. 2 heavy melting for $43 and No. 2 bundles for $41 sent scrap prices tumbling another $1 last week. The price decline was general, except in railroad and stainless steel scrap grades. Market sources don't expect to see demand increasing from mills until labor negotiations are concluded. Scrap sellers expect a major open market buyer to place its order for June tonnage soon.

Philadelphia — Major steel scrap prices are nominally lower, pending a test. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are $51-$52, delivered; No. 2 heavy melting, $43; and No. 2 bundles, $41. Electric furnace bundles are easier at $54, short shoveling turnings at $39-$40, heavy turnings at $47-$48 and low phos structurals and plate at $56-$57. Other steel grades are nominally unchanged. Cast scrap is steady, with trading moderate.

While trading in the leading open-hearth grades is at a virtual standstill, the situation is being bolstered a little by a slight pickup in export tonnage, with brokers paying $50.50 f.a.s. for the prime grades, $41.75 for No. 2 heavy melting and $39.50 for No. 2 bundles.

Cleveland — For the most part, scrap is marking time, with mill sales conspicuously absent. The market undertone continues weak, though prices are holding unchanged from a week ago. Bidding on automotive lists at the end of the month is expected to point the way for prices over the next month.

New York—Brokers' buying prices on the major steel grades have slumped sharply, with No. 1 heavy melting and No. 1 bundles holding more or less nominally at $44-$45, and No. 2 heavy melting and No. 2 bundles at $35-$36 and $33-$34, respectively. Machine shop turnings have dropped to $24-$25, mixed borings and turnings $29-$30, short shoveling turnings, $31-$32. Low phos plate and structural scrap is nominally unchanged at $49-$50.

In contrast with the drop in heavy melting steel, 18-8 stainless sheets, clips and solids have advanced to $340-$350, and 18-8 borings and turnings to $170-$180. Prices on straight chrome grades are unchanged.

Buffalo—Principal grades of steelmaking scrap are off $1 to $2 a ton here as a result of lowered offerings by brokers. No new mill business is reported, but the market undertone is definitely softer. No. 1 heavy melting is quoted nominally at $52, off $2, and No. 2 heavy melting is $41, off $1. No. 2 bundles are down $1, and No. 1 bundles followed No. 1 steel with a $2 decline. Low phos dropped $1 to $56, and railroad specialties $2 to $58.

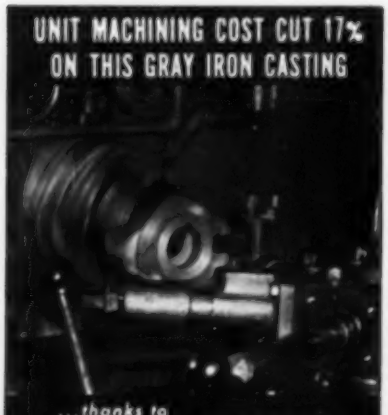
Boston — Steel scrap prices are weaker here. Heavy melting steel grades are off another $3 a ton on average, while lighter industrial grades also are lower. Short shoveling turnings are holding their strength better than most grades. Weakness is predicated on the lack of new buying and heavy shipments of tonnage sold at higher prices earlier.

Cincinnati — The market is slow here. There are so few transactions it is difficult to determine the price trend. One local dealer says his intake of scrap is slowing down.

Chicago—Scrap prices continue to slip downward, and further loss of ground would not be surprising. Failure of automobile production to rally appears to be a principal reason, although general uncertainty which is building up over the forthcoming steel wage negotiations is entering the picture. Mills are hold-

(*Please turn to page* 200)

UNIT MACHINING COST CUT 17% ON THIS GRAY IRON CASTING



...thanks to

FERROCARBO®

Users everywhere report similar experiences. In fact, on 67 machining tests in 11 large machine shops, castings of gray iron treated with FERROCARBO averaged 89.5% greater machinability per tool than untreated castings. These premium castings are finer-grained, denser, stronger, yet they COST YOU NO MORE . . . because your foundryman, using FERROCARBO, makes worthwhile savings in raw material costs.

FOR FREE BOOKLET on FERROCARBO, citing actual case histories of faster machining, with longer tool life, write The Carborundum Company, Dept. 52, Niagara Falls, N.Y.

CARBORUNDUM®

HAND PROTECTION

TOPS for QUALITY, ECONOMY, SAFETY

JOMAC HR GLOVES

- Made of long-wearing brown-and-white mock twist yarn
- Insure safe handling of rough, heavy objects
- Dependable insulation against heat
- Can be reconditioned again and again
- Interchangeable—four long-wearing surfaces with each pair
- Outwear other types of gloves by 3 to 1!

SEND FOR FREE CATALOG

Jomac manufactures all types of hand and wrist-to-shoulder protection — all made from famous loop-pile Jomac Cloth. Get your copy of the new Jomac Industrial Work Gloves Catalog. Write on your business letterhead to: Jomac Inc., Dept. E, Phila. 38, Pa.

JOMAC

INDUSTRIAL WORK GLOVES

Plants in Philadelphia, Pa., and Warsaw, Ind.
In Canada: Safety Supply Co., Toronto

Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

May 23	$50.17
May 16	51.00
Apr. Avg.	54.90
May 1955	34.87
May 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania

PITTSBURGH

No. 1 heavy melting	*48.00-49.00*
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*48.00-49.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*48.00-49.00*
Machine shop turnings	*14.00-15.00*
Mixed borings, turnings	*14.00-15.00*
Short shovel turnings	*18.00-19.00*
Cast iron borings	*18.00-19.00*
Cut structurals, 3 ft lengths	*58.00-59.00*
Heavy turnings	*47.00-48.00*
Punchings & plate scrap	*58.00-59.00*
Electric furnace bundles	*57.00-58.00*

Cast Iron Grades

No. 1 cupola	*50.00-51.00*
Charging box cast	*46.00-47.00*
Heavy breakable cast	*46.00-47.00*
Unstripped motor blocks	*34.00-35.00*
No. 1 machinery cast	*56.00-57.00*

Railroad Scrap

No. 1 R.R. heavy melt.	60.00-61.00
Rails, 2 ft and under	70.00-71.00
Rails, 18 in. and under	71.00-72.00
Rails, random lengths	65.00-66.00
Railroad specialties	64.00-65.00

Stainless Steel Scrap

18-8 bundles & solids	360.00-375.00
18-8 turnings	255.00-270.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	37.00-38.00
No. 1 bundles	49.00-50.00
No. 2 bundles	35.00-36.00
No. 1 busheling	49.00-50.00
Machine shop turnings	30.00-31.00
Mixed borings, turnings	34.00-35.00
Short shovel turnings	34.00-35.00
Cast iron borings	34.00-35.00
Low phos.	52.00-55.00
Cut structural plates 2 ft and under	55.00-56.00
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	51.00-52.00

Cast Iron Grades

No. 1 cupola	54.00-55.00
Charging box cast	43.00-44.00
Stove plate	51.00-52.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	30.00-31.00
Brake shoes	40.00-41.00
Clean auto cast	54.00-55.00
Burnt Cast	40.00-41.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
R.R. malleable	*61.00-62.00*
Rails, 2 ft and under	*69.50-70.50*
Rails, 18 in. and under	*68.00-69.00*
Rails, random lengths	*64.00-65.00*
Cast steel	58.00-59.00
Railroad specialties	*58.00-59.00*
Uncut tires	*59.00-60.00*
Angles, splice bars	*64.00-65.00*
Rails, rerolling	*67.00-68.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	345.00-355.00
18-8 turnings	205.00-215.00
430 clips, bundles, solids	100.00-110.00
430 turnings	50.00-60.00

YOUNGSTOWN

No. 1 heavy melting	53.00-54.00
No. 2 heavy melting	41.00-42.00
No. 1 bundles	53.00-54.00
No. 2 bundles	38.00-39.00
No. 1 busheling	53.00-54.00
Machine shop turnings	32.00-33.00
Short shovel turnings	36.00-37.00
Cast iron borings	36.00-37.00
Low phos.	54.00-55.00
Electric furnace bundles	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	*58.00-59.00*

CHICAGO

No. 1 heavy melting	*49.00-52.00*
No. 2 heavy melting	*18.00-39.00*
No. 1 factory bundles	*53.00-54.00*
No. 1 dealer bundles	49.00-50.00
No. 2 bundles	*36.00-37.00*
No. 1 busheling	*49.00-52.00*
Machine shop turnings	*27.00-28.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*29.00-30.00*
Cut structurals, 3 ft	56.00-57.00
Punchings & plate scrap	57.00-58.00

Cast Iron Grades

No. 1 cupola	*47.00-48.00*
Stove plate	*42.00-43.00*
Unstripped motor blocks	*35.00-36.00*
Clean auto cast	*50.00-51.00*
Drop broken machinery	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*53.00-54.00*
R.R. malleable	*61.00-62.00*
Rails, 2 ft and under	*68.00-69.00*
Rails, 18 in. and under	*69.00-70.00*
Angles, splice bars	*64.00-65.00*
Rails, rerolling	*71.00-72.00*

Stainless Steel Scrap

18-8 bundles & solids	380.00-395.00
18-8 turnings	270.00-280.00
430 bundles & solids	105.00-110.00
430 turnings	55.00-60.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*46.00*
No. 2 heavy melting	*36.00*
No. 1 bundles	*46.00*
No. 2 bundles	29.00
No. 1 busheling	*45.00*
Machine shop turnings	24.00
Mixed borings, turnings	24.00
Short shovel turnings	*27.00*
Punchings & plate scrap	*61.00*

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	39.00
Stove plate	38.00
Heavy breakable	38.00
Unstripped motor blocks	26.00
Clean auto cast	*51.00*
Malleable	52.00

BIRMINGHAM

No. 1 heavy melting	*36.00-37.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*36.00-37.00*
No. 2 bundles	*25.00-26.00*
No. 1 busheling	*36.00-37.00*
Cast iron borings	21.50-22.50
Short shovel turnings	*29.00-30.00*
Machine shop turnings	*27.00-28.00*
Electric furnace bundles	44.00-45.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48.50-49.50
Stove plate	47.00-48.00
Bar crops and plate	52.00-53.00
Structural & plate, 2 ft	51.00-52.00
Unstripped motor blocks	*37.50-38.50*
Charging box cast	32.00-33.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	*48.00-49.00*
Rails, 18-in. and under	*62.00-63.00*
Rails, rerolling	65.00-66.00
Rails, random lengths	*59.00-60.00*
Angles, splice bars	*57.00-58.00*

PHILADELPHIA

No. 1 heavy melting	*51.00-52.00†*
No. 2 heavy melting	*43.00†*
No. 1 bundles	*51.00-52.00†*
No. 2 bundles	*41.00†*
No. 1 busheling	*51.00-52.00†*
Electric furnace bundles	*54.00†*
Mixed borings, turnings	37.00†
Machine shop turnings	35.00†
Short shovel turnings	*39.00-40.00†*
Heavy turnings	*47.00-48.00†*
Structurals & plates	*56.00-57.00†*
Couplers, springs, wheels	62.50†
Rail crops, 2 ft & under	66.00†

Cast Iron Grades

No. 1 cupola	51.00-52.00
Malleable	68.00
Heavy breakable cast	54.00
Drop broken machinery	56.00

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	*33.00-34.00*
Machine shop turnings	*24.00-25.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*31.00-32.00*
Low phos. (structural & plate)	*49.00-50.00†*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Unstripped motor blocks	33.00-35.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips solids	*340.00-350.00*
18-8 borings, turnings	*170.00-180.00*
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

†Nominal

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*39.50-40.00*
No. 2 heavy melting	*30.50-31.00*
No. 1 bundles	*39.00-39.50*
No. 2 bundles	*29.50-30.00*
No. 1 busheling	44.00-45.00
Machine shop turnings	*23.50-24.00*
Mixed borings, turnings	*25.50-26.50*
Short shovel turnings	29.00-29.50
No. 1 cast	43.00-43.50
Mixed cupola cast	41.50-42.00
No. 1 machinery cast	44.50-45.00

BUFFALO

No. 1 heavy melting	*51.00-52.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*51.00-52.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*51.00-52.00*
Mixed borings, turnings	31.00-32.00
Machine shop turnings	31.00-32.00
Short shovel turnings	34.00-35.00
Cast iron borings	31.00-32.00
Low phos.	*55.00-56.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	50.00-51.00
No. 1 machinery	54.00-55.00

Railroad Scrap

Rails, random lengths	58.00-59.00
Rails, 3 ft and under	64.00-65.00
Railroad specialties	*57.00-58.00*

CINCINNATI

(Broker's buying prices; f.o.b. shipping point)

No. 1 heavy melting	49.00-50.00
No. 2 heavy melting	38.00-39.00
No. 1 bundles	49.00-50.00
No. 2 bundles	36.00-37.00
No. 1 busheling	49.00-50.00
Machine shop turnings	29.00-30.00
Mixed borings, turnings	31.00-32.00
Short shovel turnings	*32.00-33.00*
Cast iron borings	29.00-30.00
Low phos., 18 in.	54.00-55.00

Cast Iron Grades

No. 1 cupola	*46.00-47.00*
Heavy breakable cast	46.00-47.00
Charging box cast	46.00-47.00
Drop broken machinery	55.00-56.00

Railroad Scrap

No. 1 R.R. heavy melt.	*56.00-57.00*
Rails, 18 in. and under	66.00-67.00
Rails, random lengths	60.00-61.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	40.00
No. 2 heavy melting	37.00
No. 1 bundles	40.00
No. 2 bundles	33.00
No. 1 busheling	40.00
Machine shop turnings	26.00†
Short shovel turnings	27.00†

Cast Iron Grades

No. 1 cupola	45.00
Charging box cast	35.00
Heavy breakable cast	35.00
Unstripped motor blocks	35.00
Brake shoes	42.00
Clean auto cast	46.00
Stove plate	42.00

Railroad Scrap

No. 1 R.R. heavy melt.	52.50
Rails, 18 in. and under	66.00
Rails, random lengths	61.50
Rails, rerolling	70.00
Angles, splice bars	55.00

†Nominal

SEATTLE

No. 1 heavy melting	40.00
No. 2 heavy melting	36.00-38.00
No. 1 bundles	36.00-38.00
No. 2 bundles	28.00-30.00
No. 3 bundles	20.00
Machine shop turnings	23.00-25.00
Mixed borings, turings	23.00-25.00
Electric furnace No. 1	52.00-55.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	40.00-43.00
Heavy breakable cast	37.00
No. 1 wheels	37.00
Unstripped motor blocks	38.00-41.00
Stove plate (f.o.b. plant)	38.00-41.00
Brake shoes	38.00

Railroad Scrap

Rails, random lengths	48.00

LOS ANGELES

No. 1 heavy melting	35.00
No. 2 heavy melting	32.00
No. 1 bundles	37.00
No. 2 bundles	28.00
Machine shop turnings	17.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	42.00

SAN FRANCISCO

No. 1 heavy melting	40.00
No. 2 heavy melting	37.00
No. 1 bundles	39.00
No. 2 bundles	32.00
No. 1 busheling	40.00
Machine shop turnings	20.00-23.00
Mixed borings, turnings	20.00-23.00
Cast iron borings	20.00-23.00
Short shovel turnings	25.00
Cut structurals	45.00
Heavy turnings	20.00-23.00
Punchings & plate scrap	44.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	35.00
Stove plate	39.00
Heavy breakable cast	36.00
Unstripped motor blocks	32.00
Brake shoes	35.00
Clean auto cast	48.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

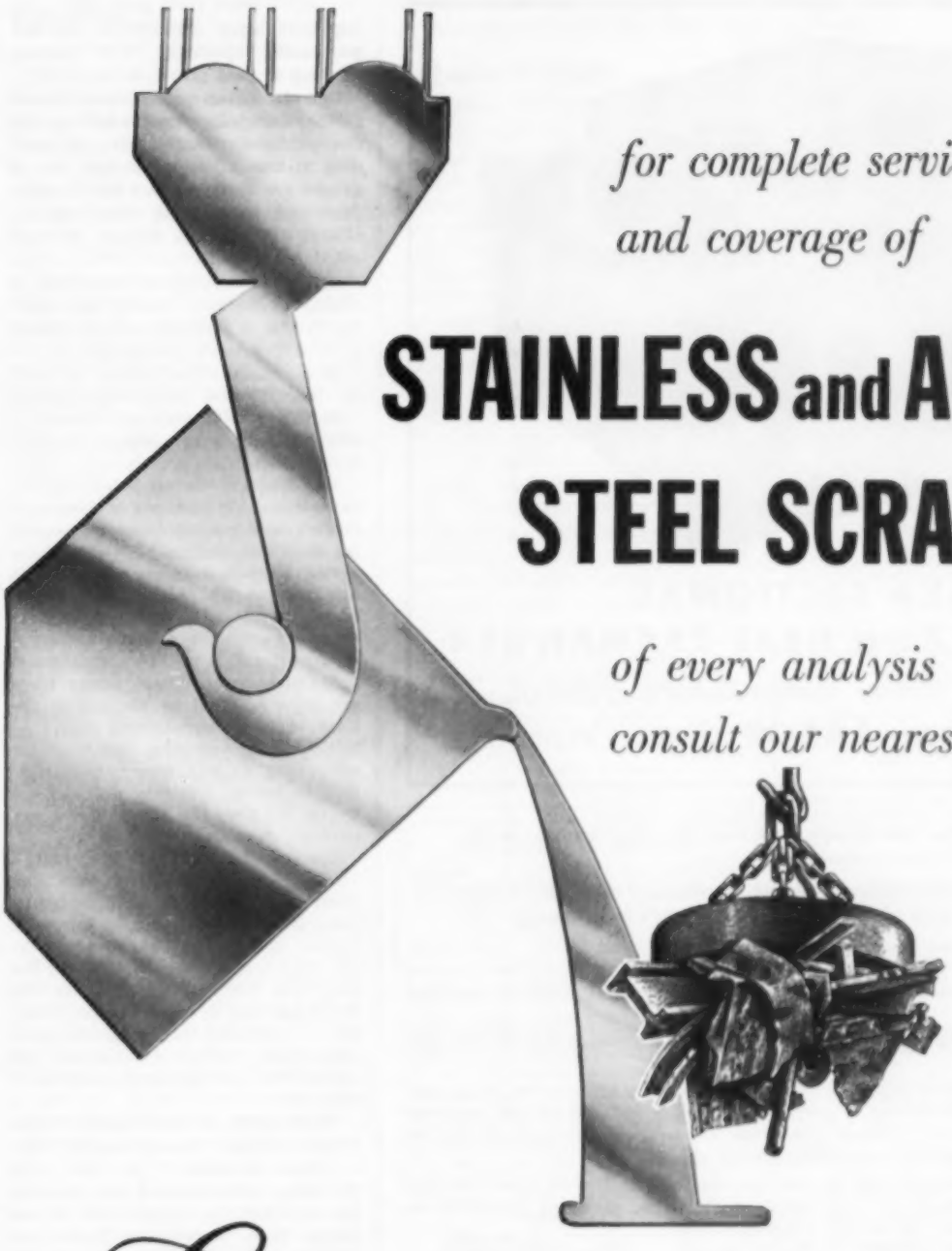
HAMILTON, ONT.

No. 1 heavy melting	50.50
No. 2 heavy melting	46.50
No. 1 bundles	50.50
No. 2 bundles	43.00
Mixed steel scrap	44.50
Mixed borings, turnings	24.00
Rails, remelting	58.50
Busheling, new factory: Prepared	48.50
Unprepared	44.50
Short steel turnings	27.50

Cast Iron Grades†

No. 1 machinery cast	50.00

†F.o.b., shipping point.



for complete service
and coverage of

STAINLESS and ALLOY STEEL SCRAP

of every analysis
consult our nearest office

Luria Brothers and Company, Inc.

main office **PHILADELPHIA NATIONAL BANK BUILDING,** *Phila. 7, Pa.*

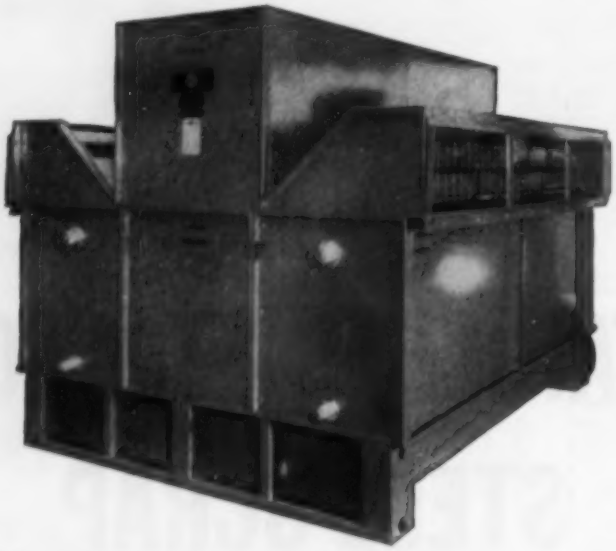
PLANTS

LEBANON, PENNA. — READING, PENNA. — MODENA, PENNA. — DETROIT (ECORSE), MICHIGAN — PITTSBURGH, PENNA. — ERIE, PENNA.

OFFICES

BIRMINGHAM, ALA. — BOSTON, MASS. — BUFFALO, N. Y. — CHICAGO, ILLINOIS — CLEVELAND, OHIO — DETROIT, MICHIGAN — HOUSTON, TEXAS — LEBANON, PENNA. — LOS ANGELES, CAL. — NEW YORK, N. Y. — PITTSBURGH, PENNA. — PUEBLO, COLORADO — READING, PENNA. — ST. LOUIS, MISSOURI — SAN FRANCISCO, CAL. — SEATTLE, WASH. — MONTREAL, CANADA

IMPORT & EXPORT — **LIVINGSTON & SOUTHARD, INC.,** 99 Park Ave., New York, N. Y. • *Cable Address:* **FORENTRACO**



NIAGARA SECTIONAL
***Aero* HEAT EXCHANGER**

gives close temperature control, saves you ***LABOR,*** *Power, Water*

- **Because the new design improves the heat transfer to the out-door air by evaporation.**
- **Because new features keep your equipment working for long life with "new plant" efficiency...always full capacity.**
- **Because you save 95% of cooling water cost.**

You get faster, more accurate cooling of industrial fluids to specified temperatures.

You improve your quality of production by removing heat at the rate of input.

You save labor in upkeep. With full access to all interior parts and piping you see everything in easy inspections. You head off dirt accumulation and corrosion. Casing panels are removable without moving the coils. The coils can be cleaned from both sides.

First cost is low; freight is low because of the lowest space/weight ratio; you save much labor in erection. Capacity range is 7,000,000 to 18,000,000 Btu/hr. No other heat exchange method gives you so much saving in money and convenience.

Write for Niagara Bulletin 132. Ask for the full story of how you can save expense in your plant and improve your product's quality.

NIAGARA BLOWER COMPANY
Dept. S. 405 Lexington Avenue
NEW YORK 17, N. Y.
District Engineers in Principal Cities

NIAGARA — *Over 40 Years' Service in Industrial Air Engineering*

(*Concluded from page 197*)

ing good scrap inventories and are purchasing sparingly, both factors tending to hold prices down.

Detroit—Scrap prices have slipped further here. Dealers are waiting for the outcome of automotive list bidding at the end of the month. No. 1 grades are down another $2. Punchings and plate scrap also has declined, with electric furnace demand off.

St. Louis—Plenty of scrap still is rolling to market. Prices are holding firmly, in contrast with the sharp drop of the week preceding.

Birmingham—The market is quiet in this district. Larger buyers of open-hearth material are receiving shipments on orders placed the first of this month.

Los Angeles—Scrap prices are erratic here . Fluctuations are so rapid dealers are having trouble keeping up with the changes.

San Francisco—Steel scrap prices are firm at the recently established higher levels. The market here is receiving some support from the higher quotations in southern California.

Seattle—Local scrap prices have not been affected by declines in the East. Mills are maintaining comparatively high inventories, but they are continuing to buy freely. Consumption is heavy. Receipts are not too heavy, but they are adequate to meet current demands.

The Orient continues to buy in large volume. Three charters from the West Coast went at $195,000 each, lump sum, free load and discharge. A similar charter was closed at $210,000 for Formosa discharge. From the Gulf and South Atlantic Coast full cargo business is reported from $250,000 to $272,000 per ship. At least eight such charters were closed this month. The average cargo runs about 9000 tons.

Washington—Consumption of ferrous materials (scrap and pig iron) in March increased 7 per cent over February and exceeded the January tonnage slightly to establish a new record high, reports the Bureau of Mines. The total melt (13,025,000 gross tons) consisted of 51.6 per cent scrap and 48.4 per cent pig iron, compared with 51.9 and 48.1 per cent in February.

Scrap consumed for all purposes totaled 6,716,000 gross tons, 6 per cent more than in February. Pig iron consumption at 6,309,000 tons, was up 7 per cent.

Stocks of scrap held by consumers at the end of March totaled 6,147,000 gross tons, a decrease of 4 per cent from the previous month. Stocks of pig iron at 1,931,000 tons, were off 2 per cent from February.

Pig Iron . . .

Pig Iron Prices, Page 185

Merchant pig iron sellers are encountering strong demand for maximum shipments in May and June. They look for sales in the first half to be slightly above those in the same period a year ago.

Requests for iron are in excess of foundry melting rates in many districts, indicating that probable higher prices after midyear and possible strike-imposed cessation of output in a few weeks are strong factors in the present situation. Even automotive foundries are making sure their inventories are generous.

The third quarter will be definitely off, sellers agree, and likely will be below the volume of 1955's third quarter.

Foundries in the Cincinnati district are maintaining a five-day work week schedule. Most foundries in that district, dependent largely on the machine tool business, are working at or near full capacity.

In Buffalo, foundries supplying the railroad equipment industry and other users of heavy castings have been operating at a high level, many at capacity.

Several blast furnaces are approaching the point where relining work will be necessary. This could force a temporary drop in pig iron output.

Iron Ore . . .

Iron Ore Prices, Page 194

Shipments of iron ore from the head of the lakes totaled 2,790,405 gross tons in the week ended May 21, reports the Lake Superior Iron Ore Association. This brings the movement to date to 13,769,129 tons. A year ago on the same date it was 10,989,857 tons, and in 1953, the record shipment year, it was 16,182,582 tons.

Of a total 259 American lake ore vessels, 257 with trip capacity of 3,021,460 gross tons were in commission as of May 15, equal to 99.2 per cent of capacity. This compares with 228 vessels with trip capacity of 2,787,900 tons, 84.13 per cent of capacity, in commission on May 15, 1955.

Alabama iron mines produced 1,372,959 tons in the first quarter this year, reports the state Department of Industrial Relations. This compares with 1,307,915 in the like period of 1955, and with 1,531,332 tons in the similar 1954 quarter. Since the latter year, Venezuelan ore has been imported by the Tennessee Coal & Iron Division, U. S. Steel Corp., and mixed with the lower grade Alabama ore. This probably accounts for the smaller state output in 1955 and 1956.

Tubular Goods . . .

Tubular Goods Prices, Page 184

Tubemakers are not likely to be able to trim their backlogs of unfilled orders before the end of this quarter. Third quarter demand is seen continuing strong.

Pittsburgh area mills say tonnage is increasing in specialty items. Orders for oil country tubes are gaining more rapidly than production, and indications are the third quarter may be the heaviest shipment quarter to date this year, particularly of high-alloy tubing.

The third quarter will also see a heavy demand for buttweld and seamless specialties, judging from early bookings for the period.

At least one major Pittsburgh producer will close its plant for two weeks in July for vacations and major repairs. This may cut shipments in the period from that plant by 15 per cent.

Southern Pacific Pipelines Inc. has asked California authorities for approval of financing plans for a $16-million pipeline from San Francisco Bay to the naval air station in Fallon, Nev.

The City of Seattle has opened bids for 532 tons of 16 and 12-in. cast iron pipe. Bremerton, Wash., will award 500 tons of 16 and 4-in. cast pipe.

A contract to supply 150 miles of 20-in. steel pipe for extension of the Interprovincial oil pipeline from Sarnia, Ont., to Port Credit, Ont., has been placed with the new pipe mill under construction at Welland, Ont., for Page-Hersey Tubes Ltd. and the Steel Co. of Canada. The order will be the first to roll off the new mill's production line when it begins operations later this year. The mill is officially named Welland Tubes Ltd. It will produce steel pipe from 20 to 36 in. in diameter.

DESIGN AND DEVELOPMENT ENGINEER

Experienced design engineer required for development work on steel mill equipment. Some knowledge of blast furnace operation and design desirable but not essential. Salary open.

John Mohr & Sons
3200 E. 96th St., Chicago, Ill.

ROLLING MILL WANTED

We want to buy a hand mill capable of producing steel reinforcing bars from billets of up to 4" x 4". Write, giving details, to

Box 423, STEEL
Penton Bldg. Cleveland 13, Ohio

TECHNICAL SALES REPRESENTATIVES WANTED

A firmly established manufacturer of industrial oils and chemicals located on Eastern Seaboard is seeking technical sales representatives having an engineering background in metallurgy or mechanical engineering. Preferred age 26 to 33 years.

Send complete resume including education, experience and salary requirements.

Reply Box 427, STEEL
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED

FOR SALE—HIGH VOLTAGE X-RAY UNIT Kelly-Koett 400 kv constant potential x-ray generator having full wave rectification and output of 20 roentgens per minute, using 7 mm of copper filtration. Adaptable for industrial radiography. Write Box 422, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

HELP WANTED
ROLL TURNER—Merchant Bar Mills 18" and 12"—Regular and special bar sections. Furnish resume, age, experience, references and salary expected. Address Box 428, STEEL, Penton Bldg., Cleveland 13, Ohio.

INDUSTRIAL FURNACE DESIGNER
Drever Company requires qualified man in broad field of furnace work. Profit Sharing Plan for all employees. Write Drever Company, Red Lion Rd. & Philmont Ave., Bethayres, Pa., Attn: Engr. Dept. This is suburban Philadelphia.

WANTED: FORGING CHIEF ENGINEER
Opening at once in mid-west forging company for this man: Age 45-55. Must know die sinking and die design and come from independent rather than captive shop. Will have supervision of die room foreman and engineering staff. Will report direct to president. Company employing 110 men. Equipment Chambersburg board hammers up through 2000 lbs. Please state experience and present compensation. Your letter will be treated with absolute confidence. Write Box 424, STEEL, Penton Bldg., Cleveland 13, Ohio.

ENGINEERING EXECUTIVE

Rapidly expanding steel company has opening for engineer whose administrative qualifications include the supervision of design, construction and layout of rolling mills—blast furnaces and steel making facilities.

Here is an outstanding opportunity if your abilities and experience meet the needs of this position.

Send complete resume, including salary requirements, to:

Box 415, STEEL
Penton Bldg. Cleveland 13, Ohio

SILENT HOIST
KRANE KAR

"HAS GIVEN US EXCELLENT SERVICE AT LOW MAINTENANCE COST," says ATLAS FORGINGS COMPANY CICERO, ILL.

"KRANE KAR Unloads freight cars of billets weighing up to 6000 lbs. . . . Stacks them in yard . . . Transports billets to saw shop . . . Loads forgings on trucks for shipment. KRANE KAR is easier to use than our old stationary crane, and saves us time. Now we can make full use of our yard for billet inventory." Ask for Bulletin #79.

Ask about our Lease-a-KRANE KAR-Plan . . . 1 to 3 Year Lease with Option to Purchase

Another SILENT HOIST "First" —FLUID DRIVE!

SILENT HOIST & CRANE CO.
Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
849 63rd Street, Brooklyn 20, N. Y.

the trend is to THOMAS

double angle shears

The inbuilt quality and ruggedness of Thomas double angle shears insure years of trouble free service with a minimum of maintenance.

If you have a need for "high production" shearing of angles it will pay you to investigate Thomas.

Sizes are built for angles up to 8"x8"x1⅛", with or without turn-table.

WRITE FOR BULLETIN 310-A

Punches • Shears • Presses
Spacing Tables • Benders

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

82

Advertising Index

Ackermann Manufacturing Co. 161
Acme Steel Products Division, Acme Steel Co. 204
Acme Welding Division of The United Tool & Die Co. 160
Air-Loc Division, Clark, Cutler, McDermott Co. 102
Air Reduction Sales Co., A Division of Air Reduction Co., Inc. 97
Alan Wood Steel Co. 133
Aldrich Pump Co., The 20
Allegheny Ludlum Steel Corporation 98
Allied Chemical & Dye Corporation, General Chemical Division 166
Alter Co., Alloy Metal Division 172
Alvey-Ferguson Co., The 167
American Brass Co., The 116
American Chemical Paint Co. 103
American Steel & Wire Division, United States Steel Corporation 146, 147
Armco Steel Corporation 62
Association of Iron & Steel Engineers 41
Atlas Car & Mfg. Co., The 27
Atlas Mineral Products Co. 179
Austenal Laboratories, Inc., Microcast Division 47
Avendale Marine Ways, Inc. 51

Babcock & Wilcox Co., The, Boiler Division 154
Babcock & Wilcox Co., The, Tubular Products Division Inside Front Cover
Baker-Raulang Co., The 45
Baldwin-Lima-Hamilton Corporation, Standard Steel Works Division 165
Basic, Inc. 115
Behr-Manning Division of Norton Co. 189
Bethlehem Steel Co. 1
Blaw-Knox Co., Foundry & Mill Machinery Division 94, 95
Bliss & Laughlin, Inc. 53
Boston Gear Works 52
Botfield Refractories Co. 46

Carborundum Co., The 84, 168, 197
Carpenter Steel Co., The, Alloy Tube Division 30
Chambersburg Engineering Co. 149
Chisholm-Moore Hoist Division, Columbus McKinnon Chain Corporation 99
Chrysler Corporation, Industrial Engine Division 31
Clark, Cutler, McDermott Co., Air-Loc Division 102
Cleveland Tramrail Division, The Cleveland Crane & Engineering Co. 163
Climax Molybdenum Co. 33
Colorado Fuel & Iron Corporation, The 43, 55
Columbia-Geneva Steel Division, United States Steel Corporation 146, 147
Columbus McKinnon Chain Corporation, Chisholm-Moore Hoist Division 99
Conco Engineering Works, Division of H. D. Conkey & Co. 145
Continental Tool Works, Division of Ex-Cell-O Corporation 5
Coolidge Corporation 85
Copper & Brass Research Association 144
Cross Co., The 171

Diehl Manufacturing Co., Electrical Division of The Singer Manufacturing Co. 44
DoAll Co., The 159
Drave Corporation 104
Dykem Co., The 196

Eastern Machine Screw Corporation, The 196
Easton Car & Construction Co. 153
Edgewater Steel Co. 137
Electric Controller & Mfg. Co., The, Division of Square D Co. 32
Elwell-Parker Electric Co., The 7
Euclid Crane & Hoist Co., The 164
Ex-Cell-O Corporation 4
Ex-Cell-O Corporation, Continental Tool Works Division 5
Exide Industrial Division, The Electric Storage Battery Co. 42

Farval Corporation, The ..... Inside Back Cover
Fate-Root-Heath Co., The, Plymouth Locomotive Works Division 21
Federal Products Corporation 127
Fenco, Inc. 164
Ferry Cap & Set Screw Co., The 49
French & Hecht Division, Kelsey - Hayes - Wheel Co. 196
Fuller Co. 54

General Chemical Division, Allied Chemical & Dye Corporation 166
General Motors, Hyatt Bearings Division 78
General Motors, New Departure Division 81
Globe Brick Co., The 191
Green, A. P., Fire Brick Co. 34

Hanson-Van Winkle-Munning Co. 30
Heyl & Patterson, Inc. 11
Hobart Brothers Co. 3
Homer Manufacturing Co., Inc. 170
Hough, Frank G., Co., The 14, 15
Hyatt Bearings Division of General Motors 78

International Nickel Co., Inc., The 58

Jomac, Inc. 197
Jones & Laughlin Steel Corporation 130, 131

Kaiser Aluminum & Chemical Sales, Inc., Kaiser Chemicals Division 134
Kelsey - Hayes - Wheel Co., French & Hecht Division 196
Kinnear Mfg. Co., The 12
Koppers Co., Inc., Tar Products Division 148

Lincoln Electric Co., The 35
Lodge & Shipley Co., The 74
Loftus Engineering Corporation 143
Lord Baltimore Hotel, The 168
Lurie Brothers & Co., Inc. 199

McLouth Steel Corporation 22

Mathews Conveyor Co. 158
May-Fran Engineering, Inc. 150, 151
Mesta Machine Co. ..... Back Cover
Michigan Drill Head Co. 48
Microcast Division, Austenal Laboratories, Inc. 47
Minnesota Mining & Manufacturing Co. 92, 139
Minnesota Mining & Manufacturing Co., Adhesives & Coatings Division 40
Morgan Construction Co. 73
Mundt, Charles, & Sons 194

National-Standard Co. 25
National Steel Corporation 13
National Tube Division, United States Steel Corporation 146, 147
National Vulcanized Fibre Co. 155
New Britain Machine Co., The 36, 37, 38, 39
New Departure, Division of General Motors 81
Newport Steel Corporation 177
Niagara Blower Co. 200
Norton Co., Behr-Manning Division 189

Ohio Steel Foundry Co., The 86

Philadelphia Gear Works, Inc. 168, 203
Phillips Petroleum Co. 7
Pines Engineering Co., Inc. 140
Pittsburgh Engineering & Machine Co., Division of Pittsburgh Steel Foundry Corporation 113
Pittsburgh Steel Co., Thomas Strip Division 17, 18, 19
Plymouth Locomotive Works, Division of The Fate-Root-Heath Co. 21
Pope Machinery Corporation 162

Republic Steel Corporation 100, 101
Research-Cottrell, Inc. 156, 157
Reynolds Metals Co. 128
Robbins & Myers, Inc., Hoist & Crane Division 24
Roebling's, John A., Sons Corporation, A Subsidiary of The Colorado Fuel & Iron Corporation 55
Rollway Bearing Co., Inc. 61
Roto-Finish Co. 190

Sandusky Foundry & Machine Co. 142
Service Steel 196
Silent Hoist & Crane Co. 202
Singer Manufacturing Co., The, Diehl Manufacturing Co. Electrical Division 44
Snyder Tool & Engineering Co. 28, 29
Square D Co., The Electric Controller & Mfg. Co. Division 32
Stamco, Inc. 196
Standard Pressed Steel Co., Flexlec Locknut Division 175
Standard Steel Works Division, Baldwin-Lima-Hamilton Corporation 165
Sterling Bolt Co. 96
Superior Tube Co. 89
Surface Combustion Corporation 118, 119

Tennessee Coal & Iron Division, United States Steel Corporation 146, 147
Thomas Machine Manufacturing Co. 202
Thomas Strip Division, Pittsburgh Steel Co. 17, 18, 19
Timken Roller Bearing Co., The, Steel & Tube Division 82
Torit Manufacturing Co. 6
Torrington Co., The, Swaging Machine Division 186
Treadwell Engineering Co. 9
Tube Methods, Inc. 93

Udylite Corporation, The 10
United Engineering & Foundry Co. 121
United States Rubber Co., Mechanical Goods Division 122
United States Steel Corporation, Subsidiaries 146, 147
United States Steel Export Co. 146, 147
United States Steel Supply Division, United States Steel Corporation 146, 147
United Tool & Die Co., The, Acme Welding Division 160

Victor Equipment Co. 56
Victor Saw Works, Inc. 16
Virginia Gear & Machine Corporation 168, 203

Wallingford Steel Co., The 152
Waterbury Farrel Foundry & Machine Co. 26
Woon Engineering Co., Inc., The 23
Woon Equipment Corporation 124, 125
Wolrton Steel Co. 13
Wendt-Sonis Co. 169
Wheatland Tube Co. 57
Whiting Corporation 91
Wickwire Spencer Steel Division of The Colorado Fuel & Iron Corporation 43
Wrought Washer Mfg. Co. 64

Youngstown Sheet & Tube Co., The 8

Table of Contents, Page 5

Classified Advertising, Page 201

KNOW-HOW
•
MODERN EQUIPMENT
•
COURTESY
•
SERVICE

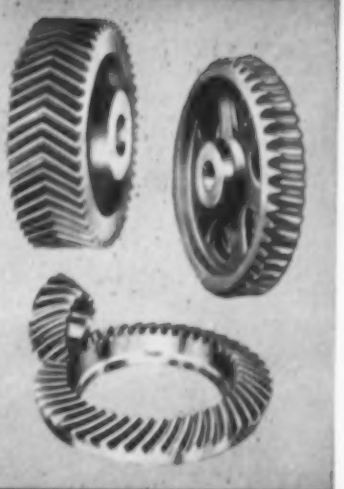
...are all yours if you order from

PHILLIE GEAR

any size, any quantity

Spur
Helical
Spur Internal
Helical Internal
Rack
Herringbone
Worm
Non-Metallic

Splines
Coniflex Bevel
Spiral Bevel
Zerol
Hypoid
Intermittent
Sprockets



PHILADELPHIA GEAR WORKS
INCORPORATED
ERIE AVE. AND G ST., PHILADELPHIA 34, PA.
NEW YORK • PITTSBURGH • CHICAGO • HOUSTON • LYNCHBURG, VA
BALTIMORE • CLEVELAND
Industrial Gears & Speed Reducers • Low-Torque Valve Controls

Check your AIM*. . . Anaconda did . . .

Bulky products unitized for faster handling

ACME STEEL STRAPPING helped eliminate slow, costly manual handling of zinc slabs at The Anaconda Company, Anaconda, Montana. Each day over 700,000 pounds of zinc are unitized by stacking and strapping and then loaded in freight cars by lift truck. And it's done in ⅓ the time of former hand loading. (Idea No. U6-3)

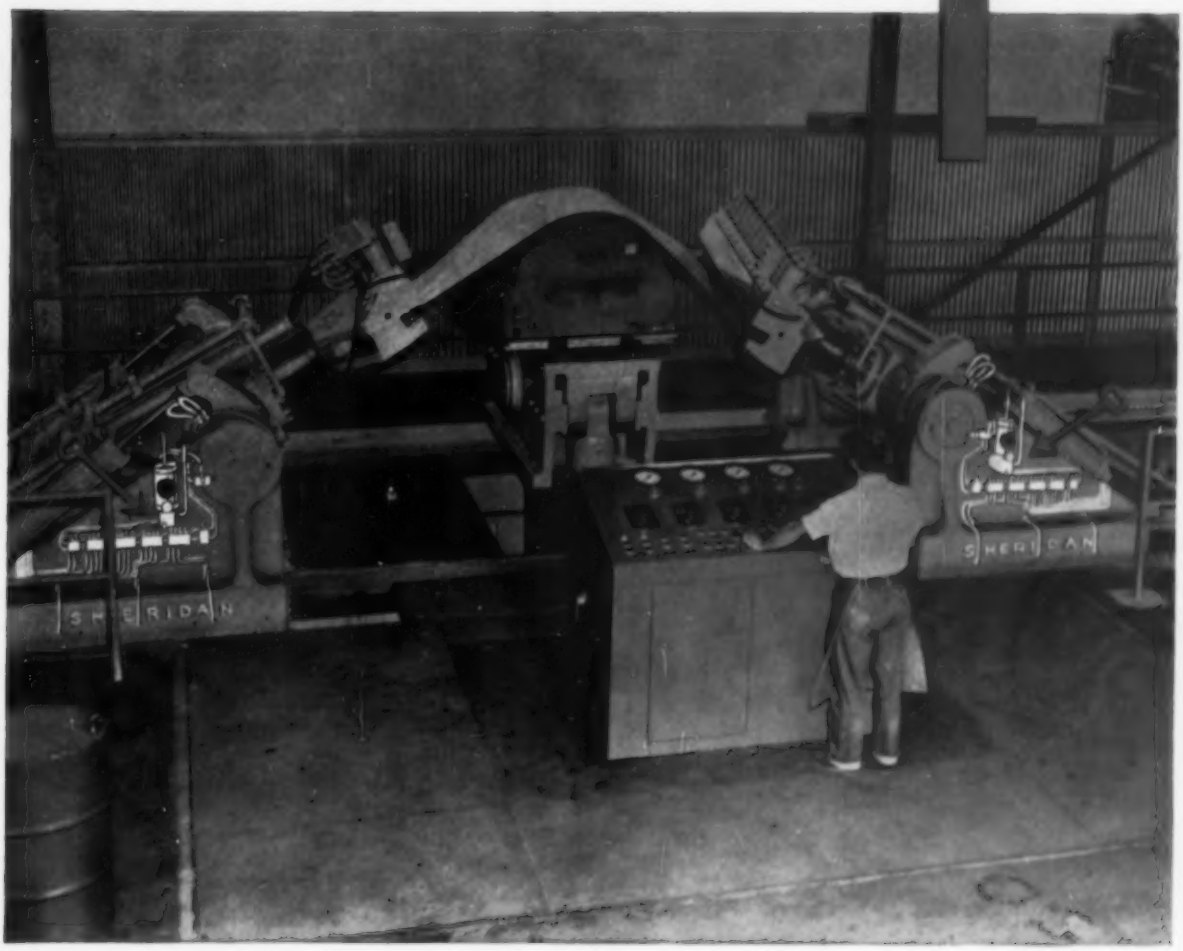
Anaconda's customers are also sold on unitizing. Unloading is fast. Inventory is simplified. Storage space is used more efficiently.

***Check YOUR Acme Idea Man today.** He will show you examples of many similar Ideas-In-Action. He can use his experience to adapt these ideas to your needs. Write to Dept. GH-56, Acme Steel Products Division, Acme Steel Company, 2840 Archer Avenue, Chicago 8, Ill. In Canada, Toronto, Ont.

ACME STEEL STRAPPING ACME STEEL

Helping a metal stretcher to form 6′ x 30′ aluminum sheets into plane parts

FARVAL—
Studies in Centralized Lubrication
No. 186



● Largest of its type on the West Coast, this 400-ton Sheridan wrap forming machine handles sheets of aluminum and other aircraft metals six feet wide and 30 feet long. It is equipped with a rapid setup panel on which the degree settings are centrally controlled, allowing the operator to work swiftly.

Farval is on the job to make sure that this swift operation continues without interruption. Through Farval's assured protection of bearings, downtime for oiling or for repairing bearings is eliminated. And, Farval contributes further to reduced costs through savings in oiling labor and lubricant.

Farval Centralized Lubrication Systems, manual or automatic, can be installed on new or old equipment. Why not let us send one of our lubrication engineers to inspect your plant equipment? He will present a written analysis of what Farval can do for you—without obligation, of course. The Farval Corp., 3270 E. 80th St., Cleveland 4, O.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing.
In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION—
Wherever you see the sign of Farval—the familiar central pumping station, dual lubricant lines and valve manifolds—you know a machine is being properly lubricated.

FARVAL
CENTRALIZED SYSTEMS OF LUBRICATION

WIDE FLANGE BEAM AND STRUCTURAL MILLS

Designed and Built by MESTA

MESTA Universal Structural Mill rolling wide flange beams on the 44" Universal Stand and the 34" Edging Stand at Inland Steel Company, Indiana Harbor Works

MESTA
THERE IS NONE BETTER

Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

PITTSBURGH, PENNSYLVANIA